Draft Remedial Investigation Report Technical Review Comments Newtown Creek Remedial Investigation/Feasibility Study Dated November 2016

Executive Summary

General Comments

1. The Executive Summary should be revised to reflect and be consistent with the general and specific comments provided for Sections 1 through 9 of the Remedial Investigation (RI) Report.

2. Any conclusions drawn from the Newtown Creek Group's (NCG's) interpretation of the hydrodynamic and sediment transport models developed for the Newtown Creek site will be revisited following U.S. Environmental Protection Agency's (USEPA's) review of these draft model codes and their inputs, interactions, and outputs.

3. A revised draft RI report should be submitted incorporating these comments, as appropriate. However, because of potential feedback to the RI Report from models that are currently under review (hydrodynamic, sediment transport, and point source models) and models that have yet to be submitted to USEPA for review (chemical fate and transport and bioaccumulation models), USEPA will not approve the revised draft RI Report until such time as all the models have been submitted, reviewed and revised, as necessary, to determine if modifications to portions of the RI Report are required. Further, while not anticipated, the FS sampling work that is to be conducted may also affect some conclusions in the RI Report. It is not unusual to review the draft RI and FS reports on an iterative and concurrent basis, and it is acceptable, and often advisable, for both reports to be finalized in the same general timeframe. A final RI Report is not needed in order to prepare the draft FS Report.

4. The Nature and Extent of Contamination Section of the Executive Summary only discusses sediment, surface water, and sources (East River and point sources). A presentation of groundwater analytical data and associated discussion of these data, similar to the level of detail presented for sediment and surface water, should be added to the Executive Summary. Furthermore, the impacts of groundwater contamination should be discussed in more detail throughout the entire Executive Summary.

5. The executive summary contains no reference to total petroleum hydrocarbons (TPH) in the in the sediment. High TPH (> 10,000 mg/kg) is found in the majority of Newtown Creek above CM 2.2, including Dutch Kills. The pervasive observation of sheens within the

sediment column also indicates the presence of free-phase hydrocarbons and should be discussed.

Specific Comments

1. Page ES-1, Site Setting and Physical Characteristics. This section should include the New York State surface water classification and the definition of that specific classification. Newtown Creek is classified by NYS as an SD waterbody. "The best usage of Class SD waters is fishing. These waters shall be suitable for fish, shellfish and wildlife survival. In addition, the water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes. This classification may be given to those waters that, because of natural or man-made conditions, cannot meet the requirements for fish propagation."

2. Page ES-2, Site Setting and Physical Characteristics, first paragraph, second sentence. The meaning of this sentence is unclear though the history of industrial and municipal discharges is well documented. Revise the sentence as follows: "Industry has used Newtown Creek extensively as a receiving waterbody for both stormwater and wastewater discharges in parallel with municipal development and sewer discharge."

3. Page ES-2, Section Site Setting and Physical Characteristics, second paragraph, second sentence. The text reads as follows: "The East River has a dominant effect on the first 2 miles of the creek through twice-daily tidal exchange that moves suspended solids in and out of Newtown Creek, resulting in deposition, resuspension, and mixing of particles in surface sediment." As an example of General Comment 2 above, the upstream extent of the East River's influence on Newtown Creek will be evaluated following USEPA's review of the draft models.

4. Page ES-3, Section Site Setting and Physical Characteristics, last paragraph:

    a. Last sentence. The text reads as follows: "Several lines of evidence demonstrate the net depositional nature of the Study Area, with net deposition rates ranging from less than 1 to as much as 7 centimeters per year (cm/year)." Provide clarifying text on the existence of localized areas of erosion, if they exist, and the spatial extent over which the deposition rates were calculated.

    b. Last paragraph. Describe the lines of evidence used to develop sedimentation rates, the data quality of each sedimentation rate line of evidence, the range of sedimentation rates provided by each line of evidence per site area, and how the individual lines of evidence were combined to arrive at the 1 to 7 cm/year deposition rate

5. Page ES-4, Section Site Setting and Physical Characteristics, first paragraph. The authors state that the sediment bed is accreting; further information should be provided to reconcile this statement with the fact that the depth of the navigation channel has not changed over time.

6. Page ES-6 and graphics on page ES-7, Section Sediment, first paragraph. The graphics compare surface sediment concentrations with the 95/95 Upper Tolerance Limit (UTL) for

surface sediment data from 14 reference areas. A more robust and comprehensive comparison of Study Area data against reference/background area data is needed in the main RI Report. See general comment No. 2 in the comments on Section 4.

7. Page ES-9, Surface Water. This section states that there are important, ongoing sources of contaminants of potential concern (COPCs) to Newtown Creek evidenced by the increased COPC concentrations during wet weather sampling events. It is not clear that the variation between wet and dry weather data truly is significant due to the large variability in wet-weather COPC concentrations and because the chemical fate and transport model has not been completed. The more appropriate conclusion is that Newtown Creek is impacted by urban run-off and CSO discharges that affect various reaches of the site. Also, since there is very limited wet-weather data for the East River, it is remains unclear if wet-weather COPC concentrations in Newtown Creek are specific to Newtown Creek or represent a harbor-wide, urban condition. The text should address these considerations.

8. Page ES-12, Sources, last bullet. This bullet should convey to the reader the significance of COPC contribution to Newtown Creek via porewater as was done in previous bullets. It is currently phrased to minimize the quantity of dissolved COPCs being transported through the sediment bed and into surface water.

9. Page ES-13, Sources, first full paragraph. The conclusion that point sources which are not "fully controlled will limit the effectiveness of remedial actions in reducing risk" is premature and not necessarily correct. Biological data from reference areas with CSO point source discharges indicate risk from CERCLA COPCs as evaluated from these data could be significantly decreased to background (reference area) levels even with continuing CSO discharge during storm events.

10. Page ES-13, Fate and Transport, first full paragraph, second sentence. Delete the following portion of second sentence: "…therefore, the locations of impacts observed today cannot necessarily be directly linked to proximate upland sites."

11. Page ES-13, Fate and Transport, second to last paragraph. The discussion regarding "fine particles being transported downstream" requires further explanation since the term "downstream" has little relevance in this system. It is unclear which parts of the study area (or areas outside the mouth of the creek?) the authors consider to be "downstream" repositories for these contaminated fine particles.

12. Page ES-13, Fate and Transport, last paragraph. This paragraph describes the process of less contaminated sediment depositing over more highly impacted sediment and subsequent mixing/dilution process that is occurring results in a decline in concentrations over time. This statement conflicts with previous statements that ongoing point source discharges "will limit the effectiveness of remedial actions" and causes confusion to the reader. Explain this inconsistency and clarify the text.

13. Page ES-14, Fate and Transport, last paragraph. It is not clear that the data support that the contaminated groundwater inputs are "a small fraction of the contaminant mass present in the subsurface sediment." Further support should be provided.

14. Page ES-17, Risk and Exposure, second bullet. If COPCs in porewater are not the cause of the toxicity observed in specified sediment locations, then other possible reasons for the observed toxicity including, but not limited to, bulk sediment comparisons, concentrations of individual compounds, and non-aqueous phase liquid (NAPL) should be evaluated and discussed.

15. Page ES-18, Section Conceptual Site Model and Conclusions, first paragraph, third sentence. The text states "…the risks to the ecological communities at many locations in the tributaries are attributed primarily to significant ongoing discharges from CSOs and MS4s." This sentence should be deleted or the basis for the assertion should be provided. Risks from CSO and MS4 discharges have not been assessed.

16. Page ES-15, Fate and Transport

    c. Continuing paragraph. A statement is made that groundwater estimated contaminant loads are attenuated as groundwater travels through the sediment bed and seeps into the surface water column. Figures 4-143, 148, & 153 appear to contradict this statement. Of the three COPCs that are presented, COPC concentrations in groundwater do not consistently attenuate and often COPC concentrations are higher in porewater seeping into surface water than concentrations in groundwater collected from the native materials (sand or clay) below the soft sediments. This conclusion seems to conflict with the applicable data. This conflict needs to be discussed in more detail, here and elsewhere in the report where this topic is presented and discussed.

    d. Second Full Paragraph. The statement is made that residual NAPL is not mobile. This is contradicted by observations of multiple regulatory agencies during ebullition surveys that show gas generated in the sediment bed by microbial activity mobilizes free-phase hydrocarbons in several areas of Newtown Creek resulting in sheens on the water surface. It is also likely that as observed sheens decay and sink to the creek bed, they are transported along the surface of the sediment bed. Revise the text to provide a more complete explanation.

    e. Third full paragraph, Ebullition – The second field ebullition study should be included and discussed in the RI Report as the results were significantly different than those of the initial field ebullition survey.

17. Page ES17, Risk and Exposure, second bullet. NAPL and/or free-phase hydrocarbons (FPHC), observed during sediment grab samples, should be included to the potential reasons for the toxicity observed in the specified locations if COPCs in porewater are not the cause. COPCs in bulk sediment should not be discounted as a line of evidence.

18. Page ES-18, Risk and Exposure, continuing paragraph. To provide a fuller picture of the fate and transport of COPCs in Newtown Creek, the following language should be included in this paragraph: "…This prevents a straightforward correlation between the TPCB concentrations in tissue samples with surface sediment concentrations in the Study Area alone, however tissue data for several of these species indicate the Study Area has a discernible effect on the concentrations of COPCs in these species."

19. Page ES-20, Tributaries, Second hyphen. To be more complete, the text should be revised as follows: "… due primarily to discharges of solids from CSO and MS4 point sources, releases of NAPL, and industrial discharges.

20. Page ES-18 to ES-21, Conceptual Site Model, first paragraph. This paragraph contradicts earlier sections of the Executive Summary. It states that solids originating from the ongoing point source discharges also contribute COPCs at levels that contribute to ecological and human risk. However, the summary earlier stated that the solids were effectively mixing with more highly contaminated sediments thereby mitigating risk. Revise the text to include an explanation of this apparent contradiction.

21. Page ES-20, Sediment CM 2+, sixth bullet (hyphen). The information presented here is biased and does not reflect significant comments provided on the basline ecological risk assessment (BERA). Remove references to CSO and MS4. Replace "other contaminants and a complex mixtures of organic compounds related to CSO, MS4…" with "NAPL, FPHC, or confounding factors."

22. Page ES-19, Section Conceptual Site Model and Conclusions, first full sentence. The text states: "Due to the net depositional nature of this reach, surface sediment concentrations are more similar to the East River than concentrations found in CM 2+ and the tributaries." Explain how this conclusion was reached when no surface sediment samples were collected from the East River.

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Section 1 Introduction

Specific Comments

1. Page 1, Section 1.1 RI/FS Objectives: Include a more general statement of the overall objectives of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Remedial Investigation/ Feasibility Study (RI/FS), which, in general, are to collect sufficient data and information to define the nature and extent of contamination at the site, support characterization of risks to human health and the environment, develop and evaluate effective remedial alternatives in the FS, and support risk management decisions and selection of a remedy. The site-specific goals and objectives described in the rest of Section 1.1 are to support the overall objectives of the RI/FS. The Section should also cite CERCLA and the National Contingency Plan (40 CFR 300), which provide the legal basis and regulatory requirements for the execution of field activities and preparation of RI/FS reports for CERCLA sites.

2. Page 4, Section 1.3, second paragraph: This paragraph states that NYC began operating a combined sewer that "regularly added raw sewage and other pollutants into the creek." For the site background to be accurate and complete, in addition to releases from municipal sources, the paragraph should be amended to similarly include statements regarding significant releases from industrial sources including by-products, sludge, spills of raw materials, and accidental releases of product into Newtown Creek. .

3. Page 8, Section 4 Description: Nature and Extent of Contamination: Add a statement explaining that, while many contaminants are present in the creek, the RI focuses on as subset of contaminants to help describe, represent and understand the nature and extent of contamination, its fate and transport, and the overall conceptual site model. See comments in Section 4 regarding in-depth evaluation of additional contaminants in the RI Report.

4. Page 8, Section 7 Description: State in the text that the baseline human health risk assessment (BHHRA) and BERA included in the RI Report are draft documents and have not been finalized or approved by USEPA.

5. Page 8, Section 8 Description. Revise the first sentence to be inclusive of all contaminants included in the RI. For example, "…a description of the pathways and processes by which the contaminants, focusing on the subset discussed previously, move throughout the various components…."). See comments in Section 4 regarding in-depth evaluation of additional contaminants in the RI Report.

6. Page 10, Section 1.4 Report Organization, Appendix G – Final Modeling Results Memorandum: State in the text that the hydrodynamic, sediment transport, and the geo-neutral point source models (and sub-models) were submitted as part of the Draft RI Report.

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Section 2 Program Summary

General Comments

1. Revise the text to note if additional studies were conducted as part of the RI but are not presented in this document (e.g., Section 2.1.7 [Ebullition] does not mention the 2016 field ebullition survey), or if additional follow-on studies are currently planned (e.g., Section 2.1.7 [Ebullition] does not mention the planned 2017 quantitative ebullition sampling).

2. For each medium discussed in Section 2, the sample summary tables and figures should be referenced in the text.

3. Summarize the applicable deviation memos for each applicable section and state in which appendix the deviation memo is located.

Specific Comments

1. Page 13, Section: 2.1, RI Studies, several paragraphs. This section mentions surface water, air, sediment, and tissue sampling conducted as part of the Phase 1 and 2 Investigations (e.g., "Phase 1 field work included multiple physical and ecological surveys, as well as surface water, sediment, and air sampling…" and "The Phase 2 field activities included multiple physical and ecological surveys, as well as surface water, sediment, and tissue sampling…"). However, no mention is made of porewater or groundwater sampling efforts. Revise Section 2.1 to include a discussion of the porewater and groundwater sample collection efforts.

2. Page 17, Section 2.1.3.1 Surface Sediment, second sentence: It is stated that one of the purposes for collecting and analyzing surface sediment samples is to *"characterize the potential for future natural recovery."* This language should be removed as it is not an explicit purpose of the RI and potentially biases the approach to the upcoming Feasibility Study (FS).

3. Page 19, Section: 2.1.4.1 Surface Water and Water Quality Profiling, first paragraph, last sentence. The text reads as follows: "Sampling was conducted mainly during dry weather periods for Phase 1 reference area and East River programs…" Provide clarification as to why the East River sampling program did not include wet weather sampling.

4. Page 20, Section 2.1.5.1 Caged Bivalves. This paragraph should include the information that one of the cages was removed early and the tissue analyzed due to high mortality.

5. Page 23, Section 2.1.5 Ecological Studies, fourth sentence: The sentence states "(see Section 2.1.5.5)". The correct referenced section is 2.1.5.6.

6. Section 2.3 Data Quality Issues, General Comment: There are several known data issues which are not addressed with sufficient depth or are wholly not addressed in the RI Report. These include the total organic carbon (TOC) data quality issues including the use of reanalyzed archived sediment TOC samples and the clarification on the use of the TOC data

in the RI report, risk evaluation, and modeling; the difference in the PCB Aroclor versus PCB congener data reported in Phase 1 versus Phase 2; and limitations regarding dry weather dissolved organic carbon (DOC) data.

7. Section 2.3, Tables 2-2a through 2-2f referring to details on meeting DQOs: These tables refer to the Interim Data Reports and Phase 1 and Phase 2 Data Summary Reports. These reports detail the data validation and data quality. However, to facilitate the RI review, the information should be tabulated and summarized to show the data that were qualified as rejected. In addition, include any corrective actions taken, and the impact on the assessments and evaluations presented in the RI Report.

8. Table 2-3, Overall RI Analytical Completeness: This table sums all the data rejected during each RI Phase. Stating that the data quality objectives (DQOs) are met is not sufficient; supporting justification must be provided. Table 2-3 is not complete as it does not show what categories of samples or analytical groups of data were rejected to give a sense of what areas of analytical or sample issues may have impacted the data quality objectives. In addition, although the total results met the completeness goal of 90%, the table does not show the completeness for individual data categories. Provide a table showing the "count results" by analyte group, consistent with the QAPP, to support the conclusion that the completeness goal was met.

9. Page 25, Section 2.3 Summary of Applicable Site Data and Data Quality Objectives:

    a. Section 2.3; first paragraph, last sentence - The text and associated tables should refer to the established within the approved QAPP, since no RI acceptance criteria were indicated.

    b. This section does not adequately address data usability as it relates to DQOs for the Newtown Creek RI/FS study.

        i. A summary of all data review performed needs to be provided in this section. Summary tables similar to those provided in Appendix B Tables B2-3 and B2-4 capturing systematic and sporadic data quality issues need to be provided for all data (Phase 1 and Phase 2) used in the RI report. Details can be referenced back to individual data summary reports or data validation reports.

        ii. Tables 2-2a through 2-2f should be revised (as needed) to reflect observed data quality issues for all Phase 1 and Phase 2 sampling programs. The two issues below are provided as examples to be reviewed and ultimately reflected on Tables 2-2a through 2-2f:

            1) The issues with point source results for TOC and hexavalent chromium (Cr6+) are not identified on Table 2-2c. The table contains "Yes" in the 'DQO-met' field – yet a reader unfamiliar with the history of sample analyses at the site would not know that these data did not meet their DQOs. Such information needs to be either captured in this table or referenced back to a systematic data quality issue summary table for point source data.

2) The issue with TOC data collected during the Phase 1 sediments investigation is not reflected in Table 2-2b. Include a summary of the source of the TOC data (initial or archived reanalyzed data), how the final TOC data used in the RI were selected and any uncertainties associated with the selected data.

Appendix B

1. Appendix B, Data Usability Assessment – Review of Phase 2 Data Summary Report.

   a. Data Validation Reports:

      i. These reports refer to the 2004 National Functional Guidelines (NFGs), yet some actions taken were not fully consistent with the NFG, such as the qualification of results due to matrix spike (MS) outliers. The 1999 and 2004 Organic NFGs state that no qualification of the data is necessary based on MS and matrix spike duplicate (MSD) data alone. Revise the data validation reports to be consistent with the NFG.

      ii. These reports note that results near the quantitation limits (<5x) were treated as exaggerated and non-detects treated as zero to calculate relative percent differences (RPDs). This approach is inconsistent with the QAPP, Worksheets 12 and 15, and with some of the other validation reports and should be corrected within revised reports.

2. Page 7, Section 2.2.3, Precision: Under NFG defer to the USEPA Region's standard operating procedure (SOP) for actions taken regarding field duplicates. The regional SOPs for inorganic data review, e.g., SOP No. HW-3b for the review of Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS) data, list specific actions to be taken when evaluating field duplicates. The regional SOPs for the review of organic analytical data leaves the application of qualifiers based on field duplicates to professional judgement. A discussion of how field duplicate exceedance was treated needs to be included in this section. Further, if the regional SOPs were not followed, an explanation for this deviation(s) must be included in the RI Report.

3. Page 7, Section 2.2.3 Precision, third paragraph:

   a. Field duplicate summary tables for Phases 1 and 2 need to be provided. These tables must include side-by-side parent and duplicate results, RPD or difference criteria results, and some indication of the results that do not meet DQOs.

   b. Include a description of or reference to the percent passing criteria for field duplicates, including an example of the calculation formula. Clarify if only calculable pairs of hits and low detects are used to obtain this value or non-detect pairs are also included in the percent passing value.

   c. Explain how the percentages of results with RPDs within criteria are calculated. Specifically, explain if non-detect result pairs were used in summation of the numerator expression when calculating the percentage.

4. Page 9, Section 2.2.4, Accuracy, Bias and Sensitivity, first bullet: Summary tables for all field blank and trip blank detections from both Phases 1 and 2 must be included.

5. Page 11, Section 2.3.1, Systematic Data Quality Issues, first bullet, second sentence: Expand on the discussion of "combination of interferences" that were cited other than the matrix interference mentioned.

6. Section 2.4, Data Usability and Limitations, all bullet items: Information such as this, from both Phase 1 and Phase 2, needs to be brought forward into RI Section 2.3 and reflected in RI Tables 2-2a through 2-2f.

7. Appendix B - Field quality control (QC) summary tables need to be prepared and included with the report. Appendix B has some discussion regarding field QC; however, tables summarizing field duplicate results, field rinsate blanks, trip blanks, and any other QC samples should be provided within the report.

Section 3 Environmental Setting

General Comments

1. Any conclusions drawn from the Newtown Creek Group's (NCG's) interpretation of the hydrodynamic and sediment transport models developed for the Newtown Creek site will be revisited following USEPA's review of these draft model codes and their inputs, interaction, and outputs.

2. The historical information provided in Section 3 needs to link to and inform the understanding of contamination in the creek. Some of the information is too detailed, and its relevance to the understanding of contamination in the creek is not clear, while in other cases not enough information is provided. If it is not relevant to understanding the site conceptual model (e.g., sources, pathways, exposure media, and receptors), it should not be included. The discussion should be revised accordingly.

3. Industrial terminology and jargon need to be clearly defined where used (e.g., green bones, lighterage, feedstock, potlines).

4. Historical information should include figures showing the geographic distribution of historical sources, when available. Discussions of historical operations should all be modified to consistently include processes and contaminants associated with the sources.

5. A summary table should be prepared that presents potential sources, waste management units, industrial processes, potential migration pathways, years of operation, and contaminants associated with potential sources.

6. Section 3 makes numerous references to the draft Data Applicability Report (DAR) dated May 29, 2012. An Addendum to the draft DAR, dated April 4, 2015, provided a limited update (series of maps and tables providing additional information). Since the last update of the DAR was in April 2015, Section 3 of the RI Report should include a summary of any significant changes in the status and/or conditions at upland facilities, including respondent properties. Also, the Addendum to the draft DAR should be referenced in the document and included in the Appendix.

Specific Comments

1. Page 26, Section 3 Environmental Setting, first paragraph, last sentence. The text reads as follows: "The interplay of these inputs, tidal exchange, and the use of this system mainly for marine transport determine the conditions in the creek today." Include groundwater seepage as a factor affecting the condition of the creek today. Also, the last sentence should be revised as follows: "The interplay of these inputs, tidal exchange, the use of this system mainly for marine transport, and the historical disposal of industrial and municipal wastes determine the conditions in the creek today."

2. Page 28, Section 3.1.1.2 Hydrogeology: This section should discuss the water bearing properties of the fractured rock. The report discusses utilities dewatering as a possible explanation for negative seepage at CM 0.0 to 0.6; however, it is not clear from the discussion of hydrogeology whether flow from the rock could be responsible for all or part of the utilities dewatering rate.

3. Page 29, Section 3.1.1.2, first full paragraph: In this paragraph, the terms "portion" and "segment" appear to be used interchangeably. The text should be revised such that usage remains consistent, and to clarify "portion" versus "segment". Since "segment" is used for describing upland contributing areas for the Tier-based calculations, "portion" needs to be defined separately.

4. Page 29, Section 3.1.2 Sediment Bed Characteristics: This section lacks relevant statistical measures of physical properties for both surface and subsurface sediments by area (e.g., individual tributaries, creek mile [CM] CM 0-1, CM 1-2, CM 2+) such as percent fines, percent sands, moisture content, and organic content. Statistical measures presented should include minimum value, median value, arithmetic average, maximum value, and standard deviation. A reference in the text that directs the reader to the appropriate tables in the appendices where additional detailed information can be found should also be included.

5. Page 31, Section 3.1.3.1 Debris, General section comment. Include a figure(s) (with appropriate reference to such figure[s] in the text of this section) showing the results of the side-scan sonar survey.

6. Page 32, Section 3.1.4 Hydrodynamics, first paragraph. The first paragraph references Figure 3-4 which uses a pie chart to present relative contributions of different sources of annual freshwater inputs to Newtown Creek. This paragraph and other portions of this Section may need to be revised based on EPA's comments on the point source (InfoWorks) and hydrodynamic models.

7. Page 32, Section 3.1.4 Hydrodynamics, first paragraph. The first paragraph references Figure 3-4 which uses a pie chart to present relative contributions of different sources of annual freshwater inputs to Newtown Creek. This paragraph and other portions of this Section may need to be revised based on USEPA's comments on the point source (InfoWorks) and hydrodynamic models.

8. Page 32, Section 3.1.4 Hydrodynamics, second paragraph, last sentence. The text reads as follows: "Groundwater inflow, where present, does not significantly affect hydrodynamic processes (i.e., circulation, stratification; see Section 4 of Appendix G) based on initial diagnostic testing with the hydrodynamic model." This statement and any others like it may have to be revised following USEPA's review of the draft hydrodynamic and sediment transport models (see General Comment 1).

9. Page 33, Section 3.1.5, Water Quality. It would be useful to indicate here the salinity of the East River and whehter it is approximately the same as the salinity range provided for the study area.

10. Pages 34 and 35, Section 3.1.6 Sediment Transport, first paragraph.

a. First sentence. The text reads as follows: "Current understanding of sediment transport within the Study Area is informed by both Phase 1 and Phase 2 data collection, as well as predictions of the sediment transport model (additional discussion of sediment transport is provided in Section 6.3, and detailed documentation of the sediment transport modeling is provided in Section 5 of Appendix G)." USEPA notes that as previously stated in General Comment 1, any conclusions drawn from the sediment transport (and hydrodynamic) draft model will be revisited following USEPA's review of the draft model.

b. Second-to-last sentence. The text reads as follows: "Sediment loads from point source discharges tend to have relatively high TOC content and are composed of an approximately even mix of fine and coarse particles (see Section 5.3.3 of Appendix G). The East River sediment load has a lower TOC content, and that load is primarily composed of fine sediment particles." The text should include reference to appropriate tables in the appendices that include data that support these statements (i.e., physical properties including percent fines, percent sands, and organic content) so the reader can develop a general understanding of how sediment load properties vary between the East River and point sources.

c. Page 35, third complete sentence: The text reads as follows: "This temporal decrease in NSRs is due to decreases in combined sewer overflow (CSO) sediment loads during the last 50 to 75 years." Add clarifying text that discusses empirical evidence (e.g., temporally spaced solids concentrations samples from CSO discharges) that support this assertion.

11. Page 35, Section 3.1.6 Sediment Transport, second paragraph, third sentence. The text reads as follows: "Ship and barge traffic lead to localized sediment resuspension, further impacting the dispersal and deposition of sediment and the chemicals sorbed to sediment." Provide a figure or other representation of recent/current vessel traffic patterns based on information collected to support the prop-wash model and reference the figure in this section.

12. Section 3.1.7, Habitat. This section must provide a discussion on the importance of the shallow water habitat provided by the study area. New York Harbor has lost the majority of its historical shallow water habitat and, as a result, Newtown Creek and its tributaries provide a unique and locally vital island of critical shallow water habitat for a variety of species.

13. Page 36, Section 3.1.7 Habitat, first paragraph, first sentence: "…intertidal habitat for wildlife using the study area is very limited." This statement does not include the bulkheads as potential habitat. In the absence of site-related contamination, the bulkheads, pilings, and rock armor are all suitable habitat for numerous species of invertebrates (e.g., crabs, bivalves, snails, worms, and barnacles) and the species that prey on them. Delete the statement that intertidal habitat is limited.

14. Page 36, Section 3.1.7 Habitat, first paragraph, second sentence: "…the extent of foraging habitat decreases rapidly as the tide rises and is close to 0% at high tide." While this may be

true for some species of birds and mammals, it does not address foraging by aquatic species (e.g., crabs, fish, starfish, and aquatic-feeding birds). As the tide fluctuates, there is actually an identical amount of foraging habitat, however it is utilized by a different suite of receptor species. Delete the statement or include a more complete discussion that does not support or describe a decrease in foraging habitat with rising tides.

15. Page 36, Section 3.1.7 Habitat, first paragraph, last sentence: "The intertidal habitat exists primarily as sediment mounds located in the tributaries near CSOs and is primarily composed of sediment deposits from the solids in CSO discharges that settle out following discharge events." To support this statement, include information in the text regarding the relative proportion of the intertidal habitat represented by "sediment mounds" vs. other intertidal habitat within the Study Area.

16. Page 36, Section 3.1.7 Habitat, second paragraph: The entire paragraph is a discussion of how non-site-related factors have potentially impacted the intertidal and subtidal habitat. However, there is no mention of more than 100 years of industrial activity, numerous oil/chemical spills/releases, multiple underground NAPL sources, ongoing industrial activities, ongoing remedial actions, or the hundreds of sediment and surface water samples that showed elevated concentrations of site-related contamination throughout the Newtown Creek system. The section is unbalanced, and must be revised to include a discussion of the contamination that is a significant cause of impacts to the benthic habitat.

17. Page 37, Section 3.1.8 Ecological Community, second full paragraph, second and third sentences: The biota collections were not exhaustive, and the methods utilized were not capable of collecting all of the different fish and invertebrates utilizing the Newtown Creek system. For example, there are hundreds of rock crabs in view at low tide, but they were not collected. For both fish and crabs, the statements should be revised to: "The dominant fish species, of those collected, are…", and "The most common species of crab collected in the study area…"

18. Page 37, Section 3.1.8 Ecological Community, third full paragraph: The list of birds, mammals, amphibians, and reptiles is not exhaustive, and other species may utilize Newtown Creek. This paragraph should be preceded by a disclaimer that the wildlife surveys were qualitative, and the species listed are those directly observed during the brief time windows of the actual field surveys.

19. Page 39, Section 3.2 Human Use, second full sentence: Delete the word "generally".

20. Page 44, Section 3.2.3 Historical and Current Shipping Activity, last sentence: The reference to the Hugo Neu site should be revised to also include a Creek Mile reference.

21. Page 45, Section 3.2.4 Navigation Channel and Dredging History, General section comment. Revise this section to include text describing the full and partial bathymetric surveys available for the site. USEPA notes that full or partial bathymetric surveys are available for the following years at the site: 1991, 1999, 2009, 2 separate surveys in 2011, 2 separate surveys in 2012, 2014, and 2015.

22. Section 3.2.6 Historical Industrial Operations:

a. This section includes an exhaustive discussion of the history of the types of industries that operated along Newtown Creek. Yet there is limited discussion of chemicals or contaminants associated with the industries and industrial processes, known or potential sources and waste streams, known or potential releases to the creek, and potential migration pathways (if known). All of these industries have the potential to have released contaminants to Newtown Creek in the past. This type of information is relevant to understanding the nature of legacy contaminants in the Study Area sediments and the understanding of the nature and extent of contamination currently observed in the creek. For each of the industry sectors evaluated in Section 3.2.6, include a discussion of the chemicals or contaminants associated with each industry or industrial process, potential sources, known or suspected releases or waste streams, and migration pathways, if known. Known or suspected historical sources should be included in a separate section, which should also include a table summarizing historical sources.

b. Various industries are discussed and potential waste products are described for each industry. In many instances, (3.6.2.4, 3.6.2.5, 3.6.2.4, 3.6.2.9) disposal of those wastes is termed, "introduced." Here, and throughout the document, replace "introduced" with "disposed" as the processes described meets the definition of "disposal" in 6NYCRR Part 375.

23. Pages 51-53, Section 3.2.6.2 Animal Rendering, Glue Factories, and Fertilizer Plants:

    a. Page 53, second paragraph. Remove the last sentence, or if it is relevant to the understanding of nature and extent of contamination, move it to a separate section regarding historical sources.

    b. Page 53, third paragraph. Move the paragraph to the section describing historical sources section.

24. Page 54, Section 3.2.6.3 Asphalt Mixing, Mining and Storage Operations, second paragraph: Revise the paragraph to explain the connection between process discharges and potential contaminats associated with the discharges.

25. Page 55, Section 3.2.6.4 Automobile Manufacture, Repair and Service:

    a. First paragraph, first and second sentence. Revise the text to provide evidence and a citation(s) that the automotive manufacture, repair, and service industries used the referenced chemicals.

    b. First paragraph, last sentence. If specific sites had spills or leaks, discuss those specific events and relevant compounds in a separate section regarding historical sources.

26. Page 56, Section 3.2.6.5 Coal Processing, Handling, Storage and Fuel Use, second paragraph: Remove this paragraph. If specific contaminants were introduced directly or indirectly into the creek, they should be discussed in a separate section to support the understanding of the nature and extent of contamination.

27. Page 57, 3.2.6.7 Distilleries:

    a. Second paragraph, second sentence. Explain what a "rectifying" distillery is and how that process is relevant to the RI Report and the understanding of contamination in the creek.

    b. Second paragraph, fourth sentence. Explain what "Lackawanna" coal is and how its use is relevant to understanding of the nature and extent of contamination in the creek. For example would any byproducts from the use of Lackawanna coal result in metals or polycyclic aromatic hydrocarbon (PAH) contamination within Newtown Creek?

    c. Eighth sentence. Discuss specific distillery sites in a separate section relative to the specific discharges.

28. Page 58, 3.2.6.8 Electronics and Electroplating, second paragraph:

    a. Second sentence. Discuss the relevance of these waste streams to the understanding of the contamination in the creek.

    b. Last sentence. Provide evidence for this assertion or remove the sentence.

29. Page 58-59, 3.2.6.9 Incinerators:

    a. Page 58. Revise the text to discuss the relevance of incinerator waste streams to the understanding of contamination in the creek.

    b. Page 58 paragraph 4 and page 59 paragraphs 1-3. Revise the text to relocate discussions of specific sites within a separate section.

30. Page 60, 3.2.6.10 Manufactured Gas Plants:

    a. Second and third paragraph: Revise the text to relocate discussions of specific sites within a separate section.

    b. Fourth paragraph: Revise the text to clearly explain the relevance of this paragraph to the understanding of contamination at Newtown Creek.

31. Page 61, 3.2.6.11 Metal Production, Smelting, and Metal Works Fabricating:

    a. Only copper smelting is discussed in this section. The text should be revised to include discussion of the other metals processed and fabricated along the creek, or the title should be revised to 'Copper Smelting', if that was the only metal production, smelting, and fabricating activity along the creek. The potential chemicals and contaminants associated with metal smelting and fabricating operations should be included in the section.

    b. Second and third paragraphs: Revise the text to relocate discussions of specific sites within a separate section.

32. Pages 62-63, 3.2.6.12 Metal Scrap and Storage:

a. Page 62 paragraph 2 and Page 63, first paragraph: Revise the text to relocate discussions of specific sites within a separate section.

33. Pages 63-64, 3.2.6.13 Paints and Pigments Industry:

    a. Page 63, second paragraph, fifth and sixth sentences and Page 64, first and third paragraphs. Revise the text to relocate discussions of specific sites within a separate section.

    b. Page 64. Revise the text to discuss the relevance of paints and pigments industry waste streams to the understanding of contamination in the creek. Polychlorinated biphenyls (PCBs) are one of the key contaminants in sediments at the site. The potential presence of PCBs in paints and pigments should therefore be discussed in the text.

34. Pages 64-65, 3.2.6.14 Paper Products Industry:

    a. Page 64, paragraph 4, second sentence. Replace "no fewer than" with "approximately"

    b. Page 65, second paragraph. Revise the text to relocate discussions of specific sites within a separate section.

35. Pages 66-68, 3.2.6.15 Petroleum Refining and Bulk Storage:

    a. Page 66. Revise the text to discuss the relevance of petroleum refining and bulk storage waste streams to the understanding of contamination in the creek.

    b. Page 67 and 68. Revise the text to relocate discussions of specific sites within a separate section.

36. Page 68, 3.2.6.16 Plastics Industry:

    a. Paragraph 2, sentence 2. Revise the text to relocate discussions of specific sites within a separate section.

    b. Revise the text to discuss the relevance of plastics industry waste streams to the understanding of contamination in the creek.

37. Page 69, 3.2.6.17 Printing:

    a. Revise the text to discuss the relevance of printing industry waste streams to the understanding of contamination in the creek.

38. Pages 70-71, 3.2.6.18 Railyards:

    a. Page 70, third paragraph. Revise the text to relocate discussions of specific sites within a separate section.

    b. Page 71, second paragraph. Provide a reference to support this assertion.

39. Page 71, third paragraph. Revise the text to relocate discussions of specific sites within a separate section.

40. Page 71, 3.2.6.19 Sawmills and Lumberyards, paragraph 4, first sentence. Correct the section reference to 3.2.6.20.

41. Page 72, 3.2.6.20 Shipbuilding:

    a. Paragraph 4. Delete sentences 5 through the end of the paragraph; they are not relevant.

    b. Revise the text to discuss the relevance of shipbuilding industry waste streams to the understanding of contamination in the creek.

42. Page 74, 3.2.6.21 Solid Waste Disposal and Landfilling:

    a. First paragraph. Provide a reference for this assertion.

    b. Revise the text to discuss the relevance of solid waste disposal and landfilling industry waste streams to the understanding of contamination in the creek.

43. Pages 74-76, 3.2.6.22 Utilities:

    a. Page 74, second paragraph. Remove sentences 3 through 6; they are not relevant.

    b. Page 74. Revise the text to discuss the relevance of the utilities industry waste streams to the understanding of contamination in the creek.

    c. Page 74, third paragraph through page 76, second paragraph. Revise the text to relocate discussions of specific sites within a separate section.

44. Page 76, 3.2.6.23 Waste Oil Refining Operations:

    a. Third paragraph. Revise the text to provide details on the specific activities and processes which encompass waste oil refining operations, and discuss the relevance of the waste streams on the understanding of contamination in the creek.

    b. Third paragraph and page 77. Revise the text to relocate discussions of specific sites within a separate section.

45. Page 78, Section 3.2.7 Current Upland Activities, Uses, and Marine Facilities: third and fourth paragraphs:

    a. Third and fourth paragraphs: The discussion of access limitations to the Study Area should be consistent with revisions that have been made in the BHHRA (e.g., bulkheads would not limit ability to fish/crab, public access to the Study Area by water is not as limited as by land). Revise "(e.g., bulkheads)" in the first sentence of Paragraph 3 to "(e.g., fences)." Revise the end of the second sentence in Paragraph 3 from "including the opportunities to fish and crab within the Study Area" to "including the opportunities to fish and crab from the shoreline within the Study Area."

    b. Third paragraph: This paragraph should also acknowledge that determined members of the public do reside, recreate, and fish in Newtown Creek. People have been observed doing all three, including swimming.

46. Pages 79-84, Section 3.2.8.1 – Historical Discharges to Newtown Creek:

    a. This section includes an extensive discussion of the history and discharges associated with municipal wastewater and stormwater infrastructure including discharges from various types of municipal discharges (direct sewage discharges, combined sewer discharges, stormwater discharges, etc.). In contrast, the discussion of industrial discharges is limited to one paragraph (page 83). Given the long industrial history of Newtown Creek, which includes numerous spills and discharges, the discussion of historical discharges is not balanced. Many of the historical industries surrounding Newtown Creek likely discharged waste to the creek without treatment. A shorter and more succinct discussion of municipal wastewater and stormwater infrastructure would suffice to provide the background relevant to evaluation of the point source discharge data collected during the RI. Revise the text to provide a more balanced discussion of historical discharges to Newtown Creek. The 1960 New York State Department of Health (NYSDOH) report should be reviewed to gather and incorporate additional information regarding historical industrial discharges to Newtown Creek.

    b. Page 79, third paragraph, first sentence. The description of the types of current discharges to Newtown Creek is incomplete. The text should be revised to include those types of discharges presented in the Sources Sampling Approach Memorandum (Anchor QEA 2013). Examples of discharge types include highway runoff, overland flow, and hydrostatic test water.

    c. Page 84, Second full paragraph, last sentence. Remove the reference to "Anchor QEA 2012n" (The DAR); the reference is redundant. The DAR cites the NYCDEP Waterbody/Watershed Facility Plan (NYCDEP 2011) as the primary reference, which is already cited in the last sentence of the paragraph.

47. Page 84, Section 3.2.8.2 Current Discharges to Newtown Creek, first paragraph, fifth sentence. The text indicates that an outfall inventory is discussed in Appendix E, however Appendix E does not include an outfall inventory or discussion. Appendix E includes only data summary tables for point source discharges. Add the point source inventory to Appendix E, or revise the text to indicate the correct appendix.

48. Page 85, Section 3.2.8.2.2 Newtown Creek WWTP Effluent Overflow:

    a. First sentence. Kwan 2014a is referenced as the source of the wet-weather conditions under which discharges from NCB-002 occur. While the reference documents the transmittal of information from USEPA, the source of the information is NYCDEP's Newtown Creek WWTP Wet Weather Operating Plan, NYCDEP, Bureau of Wastewater Treatment, Capital Project No. WP-283, April 3013. The information on treated effluent discharges to Newtown form NCB-002 is included in Table 2-1 of the NYCDEP Wet Weather Operating Plan (WWOP). Delete the reference to Kwan 2014a and cite the primary reference, which is the NYCDEP WWOP for the Newtown Creek WWTP.

    b. Revise the text of this section to note that flow splitting between the East River discharge and NCB-002 is not under WWTP operator control and is based on flow volume to the plant and the tide elevation in the East River.

c. Second sentence. The sentence should be clarified to read: "During high flows (wet weather) the discharge from NCB-002 may include…".

49. Page 85, Section 3.2.8.3 Individually Permitted Discharges. Other than the locations in Figure 3-23, this section provides limited information on individually permitted discharges. Similar to sections describing CSO and stormwater discharges, this section should be revised to include the discharge permit numbers, discharge history, and a description of the treatment systems.

50. Page 88, Section 3.2.8.4 Long-term Control Plan and Aeration System, first full paragraph, second sentence. The text states that the aeration system distributes "oxygen" into the water column. Modify the sentence to indicate that the aeration system piping and diffusers distribute air (not oxygen) into the water column in an effort to maintain dissolved oxygen above 3.0 milligrams per liter (mg/L).

51. Page 94, Section 3.2.10.2, the last paragraph. "Jamaican…" should be "Jamaica Water Supply Company".

52. Page 94, Section 3.2.10.2, the list in the 2nd paragraph. State the pumping rates of the permitted non-potable water supply wells.

53. Pages 94-96, Section 3.2.11. This section should be revised to discuss historical spills and how they may have impacted the creek.

Section 4 Nature and Extent of Contamination

General Comments

1. Key Findings, Text Box. Remove the text box from Section 4 and all other sections (Sections 5, 7, and 9). The key findings in the text boxes over-simplify and over-generalize the results and findings of the RI Report. The information in the text boxes should be integrated into the appropriate text sections and tied to the supporting data presented in the respective RI Report sections.

2. Background/Reference Area Evaluation. Comparison of surface sediment and surface water data to background reference areas is inconsistent and is not done in a systematic way. Study Area data and background/reference area data are shown on figures and tabulated in tables, but the interpretation of the Study Area data with respect to the background reference area data is generally left to the reader to infer. Statements to the effect that the data are generally within the range of background concentration or the data are generally higher or lower than background concentration do not provide the level of evaluation needed to support an understanding of the nature and extent of contamination in site media relative to background/reference area concentrations. This is a critical aspect of the RI. A systematic approach should be used that includes statistical methods to assess and compare key contaminant concentrations in Study Area media to appropriate background/reference area concentrations. The comparison should be done for specific creek areas or stretches to understand the distribution of key contaminants within the creek relative to background contaminant levels. The RI report must be revised to provide a more robust and complete evaluation of contaminants in Study Area media with background/reference area contaminant levels.

3. Selection of Contaminants for In-depth Evaluation. Section 4 evaluates three contaminants selected for in-depth evaluation in the RI Report: Total PAHs (TPAH), total PCBs (TPCBs), and copper. These three contaminants were selected because they were identified as COPCs in the draft BHHRA and as contaminants of potential environmental concern (COPECs) in the draft BERA. However, the draft BERA identified PCBs, copper, and lead as contributing to risk at the Newtown Creek Site in addition to PAHs. Similarly, the draft BHHRA concluded that PCBs and dioxins were the primary human health risk drivers, while PAHs and pesticides also contributed to risk. Given that dioxins were considered a primary human health risk driver, and lead and pesticides also contributed to risk, it is not clear why they were not selected for in-depth evaluation in the RI Report. The nature and extent of contamination evaluation in the RI Report should include dioxins, pesticides, and lead as additional contaminants for in-depth evaluation. Any additional COPECs included in the Final BERA as a result of changes made in accordance with USEPA's April 11, 2017 dispute resolution memorandum should also be considered for in-depth evaluation in the Final RI Report.

4. Cross Plots. Note: All cross plots should include regression lines and correlation coefficients to aid in evaluation of the relationship between the presented values.

Specific Comments

1. Page 98, Section 4.1 Introduction. This section indicates that the nature and extent of contamination in the Study Area and reference areas is based on concentrations of CERCLA hazardous substances in site media. However, footnote 19 states that "Contamination refers more generally to CERCLA hazardous substances that are the focus of this RI Report as well as other chemical and biological constituents that are relevant to this investigation. Other pollutants and contaminants besides CERCLA hazardous substances are considered in the other sections of this report." This statement is very vague and raises a number of questions:

    a. Describe the "other chemical and biological constituents" that are considered "contaminants" in addition to CERCLA hazardous substances and why they are relevant to the RI Report.

    b. Explain what the "other pollutants and contaminants" consist of and where in the RI Report they are described and evaluated.

    c. If the "other pollutants and contaminants" are pharmaceuticals, personal care products, and pathogens (the 3P's), these constituents were excluded from evaluation in the Human Health and Ecological Risk assessments and should also be excluded from evaluation in the RI Report. The phrase "other pollutants and contaminants" is used multiple times in Section 7 - Risk Assessment Summary of the RI Report without defining what pollutants and contaminants are being referenced. The RI Report must define the specific constituents that are considered to be "pollutants and contaminants" and the rationale supporting their evaluation in the RI Report or they should be removed from the report.

2. Page 98, Section 4.1.2 Selection of Contaminants for In-depth Evaluation: As stated in General Comment #3, the contaminants selected for in-depth evaluation should be revised to include all contaminants that present risk in either the BHHRA or the BERA. For example, dioxins and furans (as 2,3,7,8-TCCD toxicity equivalents [TEQs]) are present at concentrations greater than 10 times the sediment screening level (SL) of 0.85 picograms per gram(pg/g) in nearly all surface sediment samples collected from Newtown Creek. The nature and extent of contamination evaluation should include dioxins, pesticides, and lead in the RI Report as additional contaminants for in-depth evaluation.

3. Page 98, Section 4.1.2 Selection of Contaminants for In-depth Evaluation, first paragraph, second sentence. It is stated that the RI Report focuses primarily on concentration data for three chemicals in sediment, water, and tissue (TPAH, TPCB, and copper). Clarify in the text whether the term "water" in this sentence refers to all water samples collected during the RI including surface water, groundwater, porewater, point source discharge water, etc.

4. Page 98, Section 4.1.2 Selection of Contaminants for In-depth Evaluation, first paragraph, third sentence. The sentence states: "These three constituents have been identified to characterize the nature and extent of environmental impacts in the Study Area, based on the results of the human health and ecological risk assessments and direction from USEPA." Strike "and direction from USEPA" from this sentence.

5. Page 99, third bullet. The bullet states: "Copper is included, per USEPA's request…". Strike "per USEPA's request" from the sentence.

6. Page 100, Section 4.1.3.1 TPCB in Surface and Subsurface Sediment and Native Material, second paragraph, third sentence. There was some discrepancy between the NCG and USEPA split samples with respect to the Aroclor(s) identified at the site. Aroclor 1016 and 1260 were identified by the USEPA laboratory, while Aroclor1242 and 1254 were identified by Anchor QEA. The RI report should describe potential reasons for this discrepancy (e.g., mixing and degradation of the various PCB Aroclors) and how the discrepancy in Aroclor identification affects the interpretation of PCB data including quantification and the evaluation of sources and migration pathways.

7. Page 101, Section 4.1.3.3 TOC, third sentence. This sentence indicates that the explanation for low TOC results in Phase 1 are captured in Appendix B. Appendix B indicates that the TOC discussion is captured in the RI. Please rectify or clarify this disconnect. In addition, regardless of where the Phase 1 TOC issue is discussed, it needs to be captured/summarized in RI Section 2.3 and Table 2-2b.

8. Page 103, Section 4.1.3.5 Surface Water Particulate Phase Concentrations:

    a. Second and third paragraphs. Throughout the RI investigation there have been issues identified with the total suspended solids (TSS) results. These issues need to be identified here along with the potential impact on the referenced calculations.

    b. This section should include a discussion of how additional COPCs in the particulate phase, such as pesticides, were evaluated. Calculations of partitioning coefficients are not performed for chemicals other than PAHs and PCBs in the appendices.

9. Page 107, Section 4.2.2 Percent Fines and TOC, second paragraph, third sentence. It is stated that "In addition, there are major sources (CSOs and municipal separate storm sewer systems [MS4s]) of organic matter and solids within the tributaries, as well as at the downstream boundary at the East River, and there are anthropogenic forms of OC in the surface and subsurface sediment." The discussion of sources or organic matter and solids should not be limited to CSOs and MS4s. Other sources of organic matter and solids such as direct discharges from surrounding properties and overland flow during rain events should also be included. Revise the text to include the full range of source types contributing organic matter and solids to Newtown Creek.

10. Page 108, Section 4.2.2.1 Percent Fines:

    a. This section states that lower percent fines are generally found at the upstream end of tributaries near CSO discharges, which suggests that coarser materials are related to CSO discharges. The distribution of percent fines varies widely throughout the Study Area and there is significant overlap in percent fines data in the various reaches and tributaries. In addition, percent fines data for reference areas (Figures 4-5 and 4-6) generally significantly overlap those in the Study Area regardless of the presence or absence of CSO discharges in the reference areas. Data collected during the point source investigation should be analyzed and included in the RI Report as an additional line of

evidence to support the conclusion that coarser sediments are related to CSOs at the head of tributaries.

b. Figure 4-4 presents percent fines distribution in surface sediment based on quartiles. This results in variable ranges of percent fines levels presented in the figure. For example, the first bin covers percent fines from 1.4 to 40% (range of 38.6%), while the percent fines in the other bins range from 6 to 17 percent fines. The basis for and implications of the use of quartiles to present the percent fines data should be discussed in Section 4.2.2.1.

11. Section 4.2.2.2 TOC:

a. Page 108, first sentence. It states that the Study Area TOC ranged from 3-15%, however Table 4-3 shows a range of 0.23-20%. Resolve the inconsistency.

b. Page 108, second sentence. The text states that 4% TOC is high "compared with aquatic systems that do not have strong local sources of organic matter". The word "strong" should not be used within this comparison. Further, this statement is misleading due to an inappropriate equivalence – saying 4% TOC is high relative to a system without a source of organic matter is irrelevant. The first part of the sentence sets up the second part, "…and are consistent with high organic loads from the large CSOs", which infers that CSOs are the source of contamination, which was shown by the BERA to be untrue. Additionally, Table 4-3 shows that 8 out of the 14 reference areas had an average TOC greater than 4%. The entire statement should be deleted.

c. Page 108, third sentence. "The spatial distribution of surface sediment TOC provides further evidence of the key role played by the CSOs in discharging organic matter into the Study Area." Section 4.2.2.1 (second to last sentence) says that a lower percentage of fine sediment is found near the CSO discharges (except Whale Creek), indicating that the fine particles from the CSOs are not the primary source of TOC in the tributaries. The sentence needs to be revised.

d. Page 108, fifth sentence. The text states that the 14 reference areas exhibit TOC in the range of 1-5%, however Table 4-3 shows a much wider range of TOC, and the arithmetic average concentrations range from 1.8-9.2%. The sentence needs to be revised.

12. Section 4.2.2.3 Relationship between Percent Fines and TOC:

a. Page 109, third paragraph. Figure 4-10b, middle panel: the plotted data appear to be a random scatter plot; to say that there is a positive relationship is misleading. Further, removing the four samples NCG states to be unusually high would not result in a positive, significant correlation between TOC and percent fines. Inferring that the CSOs have something to do with the TOC/fines results not conforming to NCG's preconception is not supported. This paragraph should be deleted.

b. Page 109, fourth paragraph. It states that there is an inverse relationship in the Study Area between percent fines and TOC, however Figure 4-10b, left panel, does not appear

to show a significant relationship. Statistical analysis is required to support the statement.

c. Page 109, fourth paragraph. It states that Figure 4-10b, right panel, shows two overlapping clusters that indicate the further downstream samples are related to sediment deposited by the East River. The right panel also appears to be a random distribution, and without statistical analysis, there does not appear to be any significant relationship. Stating that the East River is the source of sediment at the downstream end of Newtown Creek is not supported by these data. Either show a significant, positive statistical relationship, or state that there is no relationship.

d. Page 110, first full paragraph. It states that the percent fines and higher TOC in Flushing Creek, Coney Island Creek, Fresh Creek Basin, and Sheepshead Bay samples are similar to the Study Area tributaries, which is consistent with the influence of large CSOs in those reference areas. While those four reference locations may indicate the lower fines/higher TOC relationship, the other 13 reference areas do not show the same relationship, nor do the presence of CSOs indicate higher TOC (Westchester Creek, Brooklyn Navy Yard, Spring Creek, and Throgs Neck all have CSOs and low TOC). The text, tables, and graphs used to describe the relationship between percent fines, TOC, and CSOs are biased and not supported by the data, and must be revised.

e. Page 110, Summary bullets. The bullets are not supported by the data as presented. Further statistical analysis must be provided to support the assertions that the downstream end of Newtown Creek is impacted by the East River, and the upstream ends of the tributaries are impacted by CSOs. Without such analysis, the current text is misleading and must be revised to more objectively reflect the data.

13. Page 112, Section 4.2.2.4 TOC Composition, last sentence. The MAM3 document is a draft document under USEPA review. Revisions required for that document may need to be incorporated here and in Section 6.6.

14. Section 4.2.3.1 TPAH:

a. Page 112, first paragraph. Detail how the 95/95 upper tolerance limit (UTL) from the reference area locations was calculated and include the data, equations, and/or what statistical software was utilized.

b. Page 112, first paragraph. This section briefly presents vague information regarding background concentrations of TPAH and refers the reader to multiple figures to identify what the calculated TPAH background value is. At a minimum, the discussion of background should be expanded to include a description of the dataset, addresses whether the data are normally distributed, what statistics were used to justify the calculations of background, the final background value, etc. (also see Section 4, general comment no. 2).

c. Pages 112 and 113, bulleted items. The range of TPAH concentrations should be provided in each bullet and corresponding reach/tributary of the study area.

d. Page 113, first four bullets. The descriptions of English Kills, East Branch, Maspeth Creek, and Dutch Kills indicate that TPAH concentrations are higher in the main stem of Newtown Creek, particularly in the Turning Basin area. This does not coincide with NCG's claim that the CSOs are a primary source of contaminants; this should be included as a bullet.

15. Page 113-114, Section 4.2.3.2, TPCB.

    a. Bullet items: The bullets indicate essentially the same pattern of contamination as was described for TPAH in Section 4.2.3.1. Again, this does not coincide with NCG's claim that the CSOs are a primary source of contaminants; this should be included as a bullet.

    b. Bullet items: The range of TPCB concentrations should be provided in each bullet and corresponding reach/tributary of the study area.

    c. See previous comment No. 14b above regarding determination of background.

16. Page 114-115, Section 4.2.3.3 Copper, bullets.

    a. The bullets indicate essentially the same pattern of contamination as was described for TPAH in Section 4.2.3.1 and TPCB in Section 4.2.3.2. This does not coincide with NCG's claim that the CSOs are a primary source of contaminants; this should be included as a bullet.

    b. The range of copper concentrations should be provided in each bullet and corresponding reach/tributary of the study area.

17. Page 115, Section 4.2.4 Impact of Recent NYC Navigational Dredging on Surface Sediment Chemical Concentrations, first paragraph, second sentence. The text reads as follows: "Multiple samples were collected from ten locations to characterize the sand cover material placed following dredging and the sediment layer just below the sand cover." The text should be expanded to discuss when the sand cover was placed (e.g., one day after dredging, one week after dredging, etc.), the thickness of the placed sand cover (including any confirmation cores or other measuring technique used to confirm the sand layer thickness), and a specific discussion of the originally placed sand layer thickness with respect to sand thicknesses identified in the Phase 2 cores, including presentation of these two sets of measurements as a table in this section. The text should also include the measured thickness of the surface sediment layer above the sand layer at each location.

18. Page 115, Section 4.2.4 Impact of Recent NYC Navigational Dredging on Surface Sediment Chemical Concentrations, second paragraph, first sentence. The text reads as follows: "Surface sediment concentrations from locations with no discrete sand cover are generally consistent with nearby Phase 1 and Phase 2 surface sediment data for TPAH, TPCB, and Cu. Surface sediment concentrations at locations with variable sand cover are generally lower than nearby Phase 1 and Phase 2 surface sediment data for TPAH, TPCB, and Cu (see Tables 4-7a and 4-7b)." Expand Tables 4-7a and 4-7b to include the analytical chemistry results for both surface and subsurface sediment for each individual coring location. For each location, also include the measured thickness of the sand layer (if present), and the relative locations

of where the surface and subsurface sediment samples were collected in relation to the sand layer (e.g., surface sediment sample collected 6-inches above top of defined sand cover layer).

19. Page 116, Section 4.2.5 PAHs, PCB, and metals composition and speciation. This section needs to include a presentation and analysis of bulk sediment copper concentration along with other bioaccumulative COPCs.

20. Page 117, Section 4.2.5.1 PAHs, first paragraph. This paragraph references the differing ratios of LPAH to HPAH in some regions of Newtown Creek. Additional discussion should be included that provides the reader with information about the locations where rations differ and what that might indicate about sources. For instance, one region where the LPAH to HPAH ratio is quite different from the reference areas is the Turning Basin (CM 2+). Does this indicate that there is a source of different PAHs in the Turning Basin?

21. Page 119, Section 4.2.5.2 PCBs, first paragraph. This paragraph states that there are different sources of PCBs to Newtown Creek based on the chlorine per biphenyl (CPB) ratio. This is likely true but there should be additional information included in the text that addresses the potential of an ongoing source that has released PCBs over time causing some to be more dechlorinated, or "weathered," in portions of the creek.

22. Page, Section 4.2.5.3 SEM, first paragraph. The first paragraph presents an analysis of AVS and SEM. AVS is extremely sensitive to the presence of oxygen. Indicate whether dissolved oxygen (DO) was measured as part of this analysis and if impacts of DO on AVS were considered.

23. Page 121, Section 4.3.2.1 Percent Fines, first paragraph, second sentence. The text reads as follows: "Lower fine sediment contents are generally found at the upstream ends of the tributaries near the CSO discharges (except for Whale Creek)." Revise the report to include a series of map figures (per Study Area) that display the locations of CSOs and industrial facilities, the sediment sample locations, and the percent fine summary statistics with depth at each location, with references to these new figures within this text section. Pending USEPA's review of these figures, the RI text may require revisions to include discussions of discernable localized patterns in percent fines relative to specific sources of contamination and the hydrodynamics of Newtown Creek.

24. Page 121, Section 4.3.2.2 TOC, first paragraph, last sentence. The text reads as follows: "This pattern suggests higher historical organic loads from CSOs, as well as industrial facilities, combined with the depositional nature of the system." Revise the report to also include a series of map figures (per Study Area) that display the locations of CSOs and industrial facilities, the sediment sample locations, and the TOC summary statistics with depth at each location, with references to these new figures in this text section. Pending USEPA's review of these figures, the RI text may require revisions to include discussions of discernable localized patterns in TOC.

25. Page 122, Section 4.3.2.3 TOC Composition, General section comment. Revise the report to also include a series of map figures (per Study Area) that display the locations of CSOs and industrial facilities, the sediment sample locations, and the PAH/TOC/soot carbon summary

statistics with depth at each location, with references to these new figures in this text section. Pending USEPA's review of these figures, the RI text may require revisions to include discussions of discernable localized patterns in PAH/TOC/soot carbon.

26. Pages 122 and 123, Section 4.3.3.1 TPAH:

    a. General section comment. Revise the report to also include a series of map figures (per Study Area) that display the locations of CSOs and industrial facilities, the sediment sample locations, and the TPAH summary statistics with depth at each location, with references to these new figures in this text section. Pending USEPA's review of these figures, the RI text may require revisions to include discussions of discernable localized patterns in TPAH.

    b. Page 123, first paragraph. This paragraph should include the range of TPAH in subsurface sediment of between 10,000 and 100,000 ppm rather than requiring the reader to refer to figures for this basic information.

    c. Page 123, bulleted items. The range of TPAH concentrations should be provided in each bullet and corresponding reach/tributary of the study area.

27. Section 4.3.3.2 PCBs:

    a. General section comment. Revise the report to also include a series of map figures (per Study Area) that display the locations of CSOs and industrial facilities, the sediment sample locations, and the PCB summary statistics with depth at each location, with references to these new figures in this text section. Pending USEPA's review of these figures, the RI text may require revisions to include discussions of discernable localized patterns in PCB.

    b. Page 124, bulleted items: The range of PCBs concentrations should be provided in each bullet and corresponding reach/tributary of the study area.

28. Section 4.3.3.3 Copper

    a. General section comment. Revise the report to also include a series of map figures (per Study Area) that display the locations of CSOs and industrial facilities, the sediment sample locations, and the copper summary statistics with depth at each location, with references to these new figures in this text section. Pending USEPA's review of these figures, the RI text may require revisions to include discussions of discernable localized patterns in copper.

    b. Page 125, bulleted items. The range of copper concentrations should be provided in each bullet and corresponding reach/tributary of the study area.

29. Page 127, Section 4.3.4.2, High Resolution Cores, bulleted items. The bullets on this page generally present only observations of the surface sediment although samples were collected down to 60 cm. COPC trends in the lower portion of the core should be compared to the upper portion of the cores.

30. Page 128, Section 4.4.2, fourth sentence and Figure 4-37. The text states that TPH concentrations generally range from 1 to 100 milligrams per kilogram (mg/kg) (see Figure 4-37). While this is true for the majority of the native material samples, there are at least 16 locations that have significantly elevated TPH concentrations (greater than 100 mg/kg) including a few locations greater than 10,000 mg/kg. These elevated TPH concentrations and their locations should be discussed in the text including any relationship to NAPL observed (visual and/or shake tests) in the native material. In addition, the text should indicate if the TPH data presented for native material does or does not include the National Grid cores.

31. Page 130, Section 4.5.1, Sediment Trap Dataset, third sentence: The text states that "Sediment traps collected depositing solids that are likely derived from multiple sources, including point source discharges (i.e., CSO and stormwater), local sediment resuspension, and the East River." Delete the parenthetical phrase (i.e., CSO and stormwater) or provide a more comprehensive list of sources that could contribute to depositing sediment such as overland flow (known to have high solids concentrations based on point source sampling), propwash, bioturbation, industrial discharges, etc.

32. Page 131, Section 4.5.2.1, Gross Solids Deposition:

    a. First sentence, including footnote 36. The discussion of what solids are collected in the sediment traps is unclear. The inference in Footnote 36 suggesting that not all settling particles intercepted by the sediment traps would otherwise reach the sediment must be explained. If this is true, then the value of sediment traps as a surrogate for sediment deposition seems suspect and brings into question the validity of the comparison of sediment trap data to surface sediment data in Section 6.4.3.2. It should also be noted in the text that sediment traps tend to overestimate sediment deposition rates because material is trapped that otherwise might not be trapped and because trapped material is not available to be eroded or transported. At best, sediment traps can be used to distinguish relative accumulation rates among trap locations.

    b. Last paragraph. This paragraph indicates that gross deposition fluxes from sediment traps were qualitatively compared to other lines of evidence (e.g., geochronology data) used to understand net sedimentation rates (NSRs) as part of sediment transport modeling (Section 5 of Appendix B Final Modeling Result Memorandum [FMRM]). This is inconsistent with the statement in the first paragraph of Section 4.5.2.1 that sediment traps do not necessarily represent long-term NSRs in the Creek bed. It also seems that, other than presenting the sediment trap data graphically in the FMRM and indicating a general decreasing trend in the solids from upstream to downstream, there was no real comparison (qualitative or otherwise) of the sediment trap data with geochronology data. Further discussion is required within the text to clarify the objectives and uses of sediment trap data for evaluating chemical fate and transport and as a line of evidence supporting development of long-term NSRs. In our view, because of the method of sediment trap collection employed, direct comparison of the sediment trap data to NSRs is not valid.

33. Section 4.5.3 Distribution of Contaminants:

a. Pages 133 through 136, bulleted items. Similar to previous comments, the range of COPCs (TPAH, PCB, copper) concentrations should be provided in each bullet and corresponding reach/tributary of the study area.

b. Page 134, first paragraph – Indicate if there a seasonal variation in vessel traffic. If so, include discussion on whehter such variation might explain the seasonal variations in TPAH and the lack of seasonal variation in PCB concentrations.

c. Page 135, paragraph 4.5.3.2.2 – This paragraph concludes that PCB concentrations do not have seasonal variations. It should also be noted that point source particulate phase PCB concentrations range approximately between 0.1 and 1.0 mg/kg (Figure 6-12a) while the sediment trap PCB concentrations above CM 2 are greater than 1 mg/kg (Figure 4-69). This likely indicates resuspension of existing, more contaminated sediment is a significant component of the sediment trap sample. This should be discussed in the text.

34. Section 4.6, General Comment. Comments in the May 2016 review of the April 1st Category 2/3 NAPL evaluation stated that "Gaps in the NAPL data will be clearly identified in the RI report." There were few if any NAPL data gaps identified within the text or in Appendix C. The text should be revised to clearly identify each recognized NAPL data gap. In addition, the text should include a statement that additional NAPL data collection activities will be completed to support the FS.

35. Section 4.6.1 NAPL Dataset and Evaluation Approach:

    a. Page 137, second paragraph. Remove the reference to "Kwan 2014b" from the text. The text should cite the original document, not an e-mail transmitting the document.

    b. Page 137, Section 4.6.1 last paragraph, third line from the bottom. "2-ounce polystyrene jar, shaken, and allowed to equilibrate for 10 minutes". The text should be revised to state how long and how vigorously the sample was shaken in the shake test, and whether this was standardized or comparable between individuals performing the test.

    c. Page 139, Second full paragraph, second sentence. Rewrite the sentence to state "The most notable visual and shake test observations, over all depths observed at each core location in sediment and native material, are shown in Figures 4-75 and 4-76, respectively."

    d. Page 139, Last full paragraph, second sentence: Add "also" to the parenthetical reference "The specific categories developed for this effort included Category 1A, Category 1B, and Category 2/3, as further described in the following (see Figure 4-77)." Delete the third sentence starting with "For example," as it is confusing before the bullet list that includes the definitions of the specific categories. Incorporate the observations provided in the last sentence into the bullet listed items.

    e. Page 140: First hyphen. The number of shake tests that result in sheens (Free Phase Hydrocarbons [FPHC]) should be included here and the total number with sheens should be broken down into surface and subsurface sediment.

f. Page 140, Last full paragraph, third sentence. Rewrite as "The four Phase 1 cores that were shake-tested during the Phase 1 program and had shake-test layer results…"

g. 31. Page 140: First hyphen – the number of shake tests that result in sheens (FPHC) should be included here and the total number with sheens should be broken down into surface and subsurface sediment.

h. Page 140, Last full paragraph, last sentence. The text should be revised to more clearly explain why Categories 2 and 3 were ultimately combined and why it is not necessary to provide this distinction. The phrase "Based on the nature of the NAPL observations" by itself is not sufficient.

i. Page 141, First full paragraph, second sentence. The value '42' should be revised to '23' as it references the cores classified as Category 2/3 in the preceding paragraph.

j. Page 141, Section Figure 4-78. The figure should be revised to include boundaries for the Category 2/3 areas presented.

36. Pages 141 to 142, Section 4.6.3 Subsurface Sediment, sentence beginning with "Bleb observations in cores…". Confirm whether this statement is true for CM 1.7 or if an exception to the statement needs to be made for that location.

37. Page 142, Section 4.6.3.2 Turning Basin Category 2/3 Area. The text includes "0.3 foot (10 cm) to 9 feet thick"; the text should consistently use English or Metric measurements or consistently provide both. Note: in Section 4.6.3.1, only metric units are given.

38. Page 145, Section 4.7.2.1 Salinity, fourth and eighth sentences. In addition to freshwater inputs from point sources and overland flow, the text should include precipitation falling directly onto the Creek.

39. Page 145, Section 4.7.2.1 Salinity. The text and Figure 4-81 compare salinity differences in shallow and deep surface water samples, yet neither the text nor the figures define the depth intervals of the shallow or deep samples. Include a table showing the depths or depth ranges for the salinity measurement in the various stretches of the creek. Measurement and/or sample collection depth should also be provided for the shallow/deep data evaluations in Sections 4.7.2.2 and 4.7.2.3.

40. Page 146, Section 4.7.2.1 Salinity. The text refers to Section 6.2 and Appendix G for additional discussion of salinity, however the discussion in Section 6.2 focuses on modeling aspects of salinity. Explain the relevance of salinity to the discussion of the nature and extent of contamination. If salinity is an important factor in the discussion of the nature and extent of contamination, then a full discussion should be presented in Section 4.7.1.2.

41. Page 146 and 147, Section 4.7.2.2 Organic Carbon:

    a. Second paragraph, last sentence. The text indicates little difference in particulate organic carbon (POC) values between Rounds 1 and 2, however the data presented in Figure 4-83 does not support this conclusion. The Round 2 POC data for many of the stream stretches (CM 0-1, CM 1-2, CM2+, and English Kills) appear to be very close to or

within the boundaries of the dry-weather data. In addition, in nearly every stream stretch, the mean values for Round 2 are lower than those in Round 1. Revise the text to reflect these differences between Rounds 1 and 2.

b. Third paragraph, last sentence: The increase in the fraction of organic carbon (f_{oc}) during wet weather is attributed to point source loads, particularly higher organic inputs from CSOs. This conclusion is made without supporting data. Actual point source discharge POC and f_{oc} concentration data should be discussed in the text and evaluated to determine if the data supports the conclusion that the increase in wet-weather f_{oc} is related to CSO discharges.

c. Last Paragraph. The Contamination Assessment and Reduction Project (CARP) data and NYC Harbor Water Sampling Program dissolved organic carbon (DOC) data that were referenced in Table 2-1 and used for comparison with the Phase 2 wet-weather DOC data must be provided in the RI Report.

42. Page 147, Section 4.7.2.3 Total Suspended Solids:

a. This section concludes that lower TSS concentrations in Round 2 relative to Round 1 are indicative of solids input from point source discharges. This conclusion is not supported by the data presented in Figures 4-87 and 4-88. Although the Round 2 TSS data are generally lower than the Round 1 TSS values, the Round 1 values are generally lower or very similar to the dry-weather values. The data could equally be interpreted as point source discharges lowering TSS during wet-weather relative to dry-weather and East River TSS levels (dilution). Point source TSS data is relevant and needs to be evaluated and brought into this discussion. Remove from the text the conclusion that the higher Round 1 TSS relative to the Round 2 levels is indicative of solids input from point sources.

b. Figure 4-88. Surface water samples were collected periodically (monthly) during Phase 1, without regard to weather. Indicate if any of the Phase 1 monthly surface water sampling was conducted during or immediately following wet weather.

43. Page 148, Section 4.7.3.1.1 Spatial Distribution, bulleted items. TPAH data in this section, and all sections, should include evaluation and discussion of the data with respect to reference area concentrations. The first bullet discusses the data with respect to reference areas, yet the second and third bullets do not provide the same context.

44. Page 150, Section 4.7.3.2.1 Spatial Distribution:

a. Page 150, last paragraph. The conclusion to this paragraph states that there is no systematic difference related to sampling depth. However, Figure 4-90 appears to indicate that in the tributaries, at higher concentrations (greater than about 0.3 µg/L), the bottom samples appear to be more impacted than shallower samples. This should be discussed in the text. Revise the conclusion accordingly.

b. Bulleted items. The temporal distribution of TPCB in surface water in the main stem locations (CM0-1 and CM 1-2) appears different than the temporal distribution of TPAH

in main stem locations. TPCBs show a general trend of higher TPCB during summer months (Figure 4-96), whereas TPAH concentrations in the main stem do not show any seasonal patterns (Figure 4-91), but show some seasonal increases in English Kills and Dutch Kills during the summer months. Include a discussion of these differences in seasonal patterns in the RI Report including discussion of the temporal differences as they relate to sources in the creek bed vs. sources derived from point source inputs.

c. Bulleted items: A range of COPC concentrations should be provided for the three bullets in this section.

45. Page 155, Section 4.7.4.2.1 Spatial Distribution, first bullet, first sentence. The statement as written is misleading in that it conflates the comparison of TPCB concentrations in English Kills with both the main stem and other tributaries. Arithmetic average TPCB concentrations in English Kills are approximately 1.4 to 2 times the TPCB arithmetic averages in main stem areas. Arithmetic average TPAH concentrations in English Kills are approximately 1.6 to 2.7 times the TPCB arithmetic averages in the other tributaries. Revise the text to clarify the comparisons of English Kills TPCB vs. main stem areas and the other tributaries.

46. Page 155, Section 4.7.4.2.2 Comparison between Round 1 and Round 2 Sampling, last sentence. Provide the rationale and basis for the judgement that the TPCB concentrations are most similar for Events 1 and 3. By visual inspection, Events 4 and 5 could also be considered similar. In addition, describe the significance of this comparison in the context of understanding the nature and extent of contamination. Remove the sentence or provide further analysis and support for the statement, including consideration of the rainfall amounts during the various events.

47. Page 156, Section 4.7.4.3.2 Comparison between Round 1 and Round 2 Sampling, last sentence. Based on the cross plots presented (Figure 4-107), Event 5 is the only event where the majority of sampling results were greater in Round 2 than in Round 1, yet the box plots (Figure 4-106), show that Round 2 copper concentrations are generally higher for most creek stretches during Round 2 vs. Round 1. Event 5, then, must be a driver for the higher copper concentrations observed during Round 2. Evaluate whether any of the conditions during Event 5 might be responsible for the copper sample results being greater during Event 5 than during the other events.

48. Page 158, Section: 4.8.1 Porewater Dataset, first paragraph, second sentence. The text reads as follows: "Porewater originates as surface water from above or groundwater from below, and represents a mixture of those two waters; the relative amounts depend on rates of groundwater movement and tidal exchange." Revise the text to read as follows: "Porewater originates as surface water from above or groundwater from below, and may represent a mixture of those two waters; the relative amounts depend on rates of groundwater movement and tidal exchange."

49. Page 158, second bullet. This bullet puts too much emphasis on the purpose and use of porewater. Delete the portion of the comment following "… to which witch benthic organisms are exposed".

50. Page 159, Section: 4.8.2.1 Salinity, first paragraph, first sentence. The text reads as follows: "Porewater salinity is useful to understand the nature and source of sampled water because porewater within the surface sediment of a coastal aquatic system can represent a mixture of more saline water from tidal surface water, and freshwater from groundwater in locations where it is discharging to the surface water." Add clarifying text on the potential for groundwater contaminated with salts to impact analytical measurements of porewater salinity.

51. Page 159, Section: 4.8.2.1 Salinity, first paragraph, second sentence. The text reads as follows: "Salinity in shallow porewater45 samples from the Study Area ranges from 3.7 to 22 practical salinity units (psu), with an arithmetic average of 18 psu (see Table 4-34)." Revise this sentence to directly note in the text (beyond the footnote) that these measurements were taken in the laboratory as part of the triad program. The revised text should also include a discussion of how in situ and laboratory measurements of salinity in porewater from the "same" sample could vary (e.g., impacts from transporting the sample from the field to the laboratory), if this variation is possible. Note which measurements were taken in situ, and which measurements were collected in laboratory experiments on the associated Table 4-34.

52. Page 160, Section: 4.8.2.2.1 TPAH Spatial Distribution; Page 160, Section: 4.8.2.2.2 TPCB Spatial Distribution; and Page 161, Section: 4.8.2.2.3 Copper Spatial Distribution, General 4.8 section comment. Revise the report to also include a series of map figures per study area segment that shows all surface sediment, subsurface sediment, porewater, and groundwater concentrations for each individual COPC identified in General Comment 3 to aid the reader in understanding the interplay between the various strata and matrices, as well as contaminant distributions. This series of requested maps would be prepared for the following Study Area Segments (or whatever study area segments are identified in the final RI): CM 0 to 1.2, CM 1.2 to 2.6, CM 2.6+, Dutch Kills, Whale Creek, Maspeth Creek, East Branch, and English Kills. Pending USEPA's review of these figures, the report text may require revisions to include discussions of discernable localized contaminant patterns.

53. Section s 4.8.2.2.1 and 4.8.2.2.2, bulleted items. The bullets in these sections should contain ranges of COPCs.

54. Page 166, Section 4.9.1 Groundwater Dataset, second paragraph. A discussion of colloidal transport should be added. Colloidal transport can be an important mechanism for the migration of PAHs and PCBs in porous media. The use of dissolved phase concentrations alone is a non-conservative estimate of contaminant loading for these organic compounds. If there is a concern that "total" analysis using unfiltered samples would bias the results high, explain why the results were not bracketed between total and dissolved concentrations.

55. Page 167, Section 4.9.2.1 Spatial Distribution, second paragraph. Provide the typical range of TSS in ambient groundwater to justify the statement included in the last sentence.

56. Section 4.9.3, multiple pages. All of the bulleted lists in this section should contain ranges of applicable COPCs instead of using qualitative terms such as concentrations are "higher" or "lower."

57. Page 169, Section 4.9.3.1.1 Spatial Distribution, paragraph following bulleted list. If impact by NAPL is a concern, provide a comparison of the solubility limits of individual PAHs to the values detected or calculated at these locations. Dissolved phase concentrations that have been impacted by free or residual saturation should be counted as part of groundwater loading.

58. Section 4.10.1 - Tissue Dataset; Section 4.10.2.1 Fish and Crab; Section 4.10.2.2 Bivalves; and Section 4.10.2.3 Benthic Invertebrates. Figure 2-19 has too many symbols that overlap. It is not possible from the figure to understand where tissue samples were collected. The figure must be revised and/or broken into multiple figures.

59. Page 175 through 178, Section 4.10.3, bulleted items. Bulleted descriptions of the tissue dataset should include ranges of the COPCs.

60. Page 176, Section 4.10.3.2 TPCB, first sentence. Box plots, on a log scale, are used to compare the Study Area to the Reference Area tissue PCB concentrations. The use of a log scale compresses the spread of the data to infer that there is little/no difference between the Study Area tissues and the Reference Area tissues. While tissue concentrations are variable, and there is some overlap in the individual species, the use of an arithmetic scale would give a more representative visual representation of the differences between the Study Area and the Reference Area tissues. The figure should be revised.

61. Page 179, Section 4.11.1 Background Data Sources, second paragraph. The impact of the detected background concentrations on the evaluation of the air sample data results for the Study Area needs to be clearly summarized in this section. For example, the concentrations for benzene in several background locations exceed the USEPA regional screening level. USEPA previously commented on contaminant concentrations of selected background locations in comment No. 2 of the October 22, 2015 Air Presentation, Comment/Response Matrix. The limitations of the background samples need to be captured in this section.

Appendix C

1. Appendix C, General Comment. This appendix was difficult and tedious to review. It includes extensive and redundant discussion on methodology with minimal substance on findings and discussion of NAPL distribution as would be expected in Section 4 – Nature and Extent of Contamination. Work Plan approaches and methodology details should be discussed in Section 2 – Program Summary.

2. Appendix C, Cross sections. The cross sections should be revised to improve clarity. It would be clearer if No Recovery (currently white) was indicated by a hatch mark pattern so it was clear where no data are available. The No Visible Observation (currently grey) could be white, and the presence of sheen and other observations of impacts noted as grey or another dark color. This is true of the shake test results as well. Finally, indicate in a legend that the grain size observations are placed besides the borings.

3. Figure C4-3. This figure does not extend downstream far enough to plot borings DK041SC-A and DK12SC-A which are presented on Figure C4-4.

4. Page 20, Section 3.2 Sediment lithology, second full paragraph, last sentence. Follow up on "…based on visual observations" to describe any standardization or quantification of the visual observations either by training of field personnel on sample descriptions or by use of grain size sieves or analyses.

5. Page 24, Section 3.3.3 Native Material, bottom of the page. Include a discussion regarding the stratigraphy/grain size of the deep NAPL observation.

6. Page 28, Section 4 Evaluation and Interpretation. Some discussion is warranted regarding observations around the areas that USEPA identified as NAPL-containing and why two of the five were not carried through as the three with observed NAPL.

7. Page 36, section 4.3.3.1 Area B, second sentence. This sentence lists core NC022CSC as "adjacent" to NC271SC-A, when NC022CSC is actually mid-channel and NC271SC-A is adjacent to the bank. The text should be revised accordingly.

8. Page 37, Section 4.3.3.2 Area C, Second full paragraph. "is not associated with a more substantial area of NAPL impacts". This conclusion should be revised to limit the characterization to apparently mobile (i.e., Category 2/3) NAPL. The number of cores with significant blebs, sheens, oil staining, etc. is extensive in this area.

9. Page 37, Section 4.3.3.3 Area E. This Section references Figure C4-9e and C4-10f, but the former only goes to Creek Mile 2.38 and the latter starts at 2.38 and goes to 2.48. Reference Figure C4-9f for a sufficient plan view.

10. Page 39, definition of lateral limits of Category 2/3 areas. These are acceptable for initial bracketing, but items in the first two bullets will likely require further evaluation to confirm the extent of potentially discontinuous NAPL. Some statement to that effect is warranted in the text.

11. Page 41, Section 4.4.1.2 Step 2 – Characterize the Extent of Category 2/3 NAPL Observations, first full paragraph. "the sand layer associated with the Category 2/3 observations is discontinuous and limited in extent". Note that all underlying native material is described as 75% coarse grained sediment and is therefore continuous. The top of native material could be the conduit to more discontinuous coarse grained strata at the base of the sediment column. The text needs to be revised to reflect these conditions.

12. Page 41, Section 4.4.1.2 Step 2 - Characterize the Extent of Category 2/3 NAPL Observations, paragraph describing Cross Section 1. "and upstream by NC056SC-A". Note that this core is >500 feet upstream. Only one boring upstream of NC262SC-A was noted in the plans for FS sampling to provide additional bracketing of the Category 2/3 NAPL in this area.

13. Pages 41 and 42, Section 4.4.1.2 Step 2 - Characterize the Extent of Category 2/3 NAPL Observations. "Differences in observations in collocated cores indicate that the lateral extent of Category 2/3 NAPL in this area is limited." This conclusion is questioned and should be evaluated during the FS sampling. Additional discussion to support the

conclusion should be provided in the text. It is possible that the area of Category 2/3 NAPL is somewhat widespread yet that distribution is discontinuous.

14. Page 45, Section 4.4.2.2 Step 2 - Characterize the Extent of Category 2/3 NAPL Observations, first paragraph. "GPEC-SB113 also provided a lateral limit of Category 2/3 observations in this area". This boring is very close to others with Category 2/3 observations and no delineation borings were proposed in this area in the FS field program. An additional delineation boring is needed to provide better definition of the extent of Category 2/3 NAPL.

15. Page 54, Section 5, last paragraph. "do not represent more substantial areas of NAPL impacts". See comment for Section 4.3.3.2 Page 37, final paragraph stating "is not associated with a more substantial area of NAPL impacts". This conclusion should be revised to limit the characterization to apparently mobile (i.e., Category 2/3) NAPL. The number of cores with significant blebs, sheens, oil staining, etc. is extensive in this area of multiple oil terminals.

16. Section 5, Page 55, second paragraph: "This dataset is sufficient for completing the RI because the NAPL was observed deep in the native material (greater than 10 to 50-plus feet below the mudline)." This sentence should not start a new paragraph because it is intrinsically linked to the description of vertical characterization of NAPL in the preceding paragraph, and it needs to be qualified regarding why the data set could be considered sufficient for the RI. It would also be important to note in the text that the deep impacts noted here could be a potential continuing source of groundwater contamination.

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Section 5 Sources

General Comment

1. Any conclusions drawn from the NCG's interpretation of the hydrodynamic and sediment transport models developed for the Newtown Creek site will be revisited following USEPA's review of these draft model codes and their inputs, interaction, and outputs. USEPA's comments on the models submitted with the RI Report will be provided separately.

Specific Comments

1. Page 185, Section 5.1 Point Sources and Overland Flow, second paragraph, first sentence. The description of the types of point source to Newtown Creek is incomplete and does not include all of the types of point discharges described in Sections 5.1.1.1, 5.1.1.2, and 5.1.1.3. The text should be revised to provide a more complete description of the range of point source discharges. For example, the description does not include individually permitted wastewater discharges or highway drains.

2. Figure 5-1. Add title, legend, scale, north arrow. NCB CSOs should be labeled with dashes (e.g., NCB-002 and NCQ-029).

3. Page 186, Section 5.1.1.2 Category 2 – Combined Sewer Overflows and WWTP Effluent Overflow, second bullet:

    a. Delete the reference to Kwan 2014a in this section and all other sections of the RI Report. The actual source of the information to be cited is NYCDEP's Newtown Creek WWTP Wet Weather Operating Plan (WWOP), NYCDEP, Bureau of Wastewater Treatment, Capital Project No. WP-283, April 3013. The information on treated effluent discharges to Newtown Creek from NCB-002 is included in Table 2-1 of the NYCDEP WWOP

    b. In several sentences in this section (and in other section of the RI Report) the discharge from the high-relief wastewater treatment plant (WWTP) outfall is called "effluent". The discharge should be characterized as "treated effluent"; this change should be made throughout the RI Report.

4. Page 189, Section 5.1.2.1 Sources of Flow Data:

    a. First full sentence. The 2015 geo-neutral point source model was used to estimate CSO and stormwater flow (including overland flows) for loading estimates for the 5-year period from 2008 through 2012. Explain the rationale for the selection of the 2008 through 2012 5-year period.

    b. First full paragraph: Section 4 of Appendix G is referenced as the source discharges not included in the geo-neutral point source model; a more specific reference is required. Section 4 of Appendix G is over 40 pages long and includes numerous tables and figures.

c. Exxon Mobil Greenpoint Remediation Project. Estimated Annual discharge volume was estimated from 2012 (January 2012 through December 2012) Discharge Monitoring Reports (DMRs). Provide the rationale in the text for the use of 2012 data (and not another year or years) to represent annual discharge for EM001A and EM002.

5. Page 195, Section 5.1.3.2, first paragraph and Table 5-3 and Figure 5-5, point source POC data. Per USEPA e-mail of October 4, 2016, USEPA provided an approach for adjusting the point source POC data and performing sensitivity analysis to assess the impact of the adjusted data on modeling results. Explain in the text or a footnote to Table 5-3 and Figure 5-5, whether the POC data are the original, unadjusted data or the adjusted data. In addition, include the results of the sensitivity analysis and what impacts, if any, the use of the adjusted data had on the point source loading results.

6. Page 201, Section 5.1.4.1. There is no discussion as to why the fixed concentration loading method was selected. A buildup-washoff methodology with time-varying concentrations should be discussed in the main text, with justification of the principal reasons for selecting the fixed concentration method.

7. Page 209, Section 5.2.1 Groundwater Discharge, paragraph 2. This section describes the groundwater seepage study that was performed by the USGS to quantify groundwater seepage rates (positive and negative) to Newtown Creek. It states that the study "…measured the net discharge of water from surface sediment to surface water…" Loading of dissolved COPCs to the Study Area is based on the discharge rates measured by the USGS. Using the "net" seepage rate underestimates the actual COPC load discharging to the study area because it fails to account for the impact of tides on the seepage rates. At seepage meter location NC286, an average net flow of 0.0 cm/day was measured and used to develop Figure 5-19b. At this location, 0.0 kg of COPC is estimated to be discharged. However, actual seepage fluctuates between positive and negative 0.5 cm/day approximately twice per 24 hour period resulting in gross positive seepage greater than 0.0 cm/day. COPCs in the porewater discharge to surface water during intervals of positive seepage, up to 0.5 cm/day, not 0.0 cm/day. An analysis of COPC migration from surface sediment to surface water, using gross discharge, should be performed throughout the study area to evaluate whether COPC loading quantities are significantly different from existing estimates.

8. Page 210, Section 5.2.1.2 Groundwater for Segment Groups and Individual Segments, second paragraph, Table 5-15. The magnitude of negative seepage near the mouth of Newtown Creek is inconsistent with the geology in that area. Cross sections indicate the presence of rock or clay below the sediment, which would limit seepage rates even with a relatively high vertical gradient. This provides further evidence that the seepage meter results should be reinterpreted or seepage rates should be re-measured. The report should indicate that additional seepage data will be collected as part of the FS field program.

9. Page 210, Section 5.2.1.2, second paragraph, Page 210. The text should explain in more detail how the multiplier for shoreline type was selected.

10. Pages 213 and 214, Section 5.2.3, second paragraph bullets. Bullet No.1 concludes: "total net groundwater discharge is approximately zero or negative", but this is heavily influenced by the significant negative value from the most downstream USGS seepage meter. Therefore, cite the need to repeat and enhance the spatial coverage of seepage metering, per USGS recommendations and consensus reached during modeling meetings in the Spring/Summer of 2016. Bullet No. 2 cites Section 6.4.1 and Appendix Table E-C-1 but should instead cite Section 4.9.1 for partitioning information as stated in Section 5.2.2. . USEPA may choose to revisit the groundwater discharge estimate after the additional seepage meter data is collected.

11. Page 215, Section 5.3.1 TPAH, second paragraph, fourth sentence. The text reads as follows: "Concentrations were slightly higher during some of the warmer months, with the highest (and most variable) concentrations measured occurring in August…". Revise the text to include possible explanations for these highly variable and elevated concentrations associated with the mid-August sampling event.

12. Page 218, Section 5.3 East River, first paragraph. This paragraph states that copper concentrations in the East River are comparable to those found in Newtown Creek and references Figure 5-29. It should also include that concentrations in CM 2+ and Maspeth Creek are higher than other sampling locations.

13. Page 218, Section 5.4, East River, first paragraph: "Groundwater seeps" should be included with the list of factors that contribute to bank erosion.

14. Page 218, Section 5.4 Bank Erosion, first paragraph, second sentence. The text reads as follows: "Susceptibility to bank erosion increases when erodible soils are exposed to surface water currents, stormwater runoff, wind, and over-steepened bank conditions." Revise the statement to read as follows: "Susceptibility to bank erosion increases when erodible soils are exposed to surface water currents, stormwater runoff, waves, vessel wakes, and over-steepened bank conditions."

15. Page 219, Section 5.4.1 Bank Erosion Significance Rationale, second paragraph, first and second sentences. The text reads as follows: "For a bank erosion source pathway to be complete, data indicating contaminants are present in the bank soils must be available and bank erosion must exist in order to transport the contaminants to the creek. The presence of contaminants at adjacent upland sites generally has not yet been evaluated by NYSDEC or USEPA." Add additional text describing the proposed sampling approach for evaluating the erodibility of riverbanks and characterizing riverbank materials. Furthermore, add text discussing the potential for groundwater migrating through contaminated bank materials to transport these contaminants to the waters of Newtown Creek.

16. Page 221, Section 5.4.2 Current Status of Bank Erosion Pathways, last paragraph, last sentence. The text reads as follows: "Sites with moderate, low, or incomplete bank erosion pathways are documented in Table E4-1 of the draft SSAM (Anchor QEA 2014n)." USEPA has indicated that data gaps exist in the RI regarding shoreline contaminant concentrations and distributions. This information may be pertinent during the evaluation of any shoreline

remedies that are conducted in conjunction with the in-water remedy. Bank erosion data gaps identified will be addressed during the FS field sampling program. This information should be stated in the RI Report.

17. Page 222, Section 5.5 Atmospheric Deposition, last paragraph. Atmospheric deposition loading estimates are compared to TPAH, TPCB, and copper point source loading estimates. For context and a more robust evaluation, compare atmospheric loading estimates for TPAH, TPCB, and copper to groundwater loading estimates for the same constituents.

18. Page 224, Section 5.7 Contaminant Seeps. During the 2016 Field Ebullition Study (FES), seeps were noted in some locations. Discuss within the text the seeps identified during the 2016 FES. In addition, others have observed seeps from the banks of Newtown Creek. Indicate in the text that seeps will be identified and sampled in the FS Field program and the data evaluated in the FS.

Section 6 Fate and Transport

General Comments

1. Any conclusions drawn from the NCG's interpretation of the hydrodynamic and sediment transport models developed for the Newtown Creek site will be revisited following USEPA's review of these draft model codes and their inputs, interaction, and outputs. Also, because of potential feedback to the RI Report based on the chemical fate and transport and bioaccumulation models, the RI Report may require additional revision after those models are completed.

Specific Comments

1. Page 226, Section 6.1 Introduction, first paragraph. The mechanism of ebullition needs to be added to this paragraph and to Figure 6-1.

2. Page 228, Section 6.2.1 Freshwater Inflow, last paragraph. Resolve the inconsistency caused by this passage indicating that the estimated groundwater inflow is 1,100 million gallons per year (MGY); this conflicts with the statement in Section 5.2.3 indicating that the total net groundwater discharge is near zero or negative.

3. Page 229, Section 6.2.2 Current Velocities, Circulation, and Tidal Effects, first paragraph. The text states: "Typical of a dead-end tidal channel, current velocities have a maximum value near the mouth of Newtown Creek and decrease with increasing distance from the East River, with relatively stagnant conditions in the upper portions of the Study Area (e.g., East Branch and English Kills)." The term "stagnant' is qualitative and subject to interpretation. Revise the sentence as follows: "…and decrease with increasing distance from the East River, with the lowest current velocities occurring in the upper portions of the Study Area (e.g., East Branch and English Kills)."

4. Page 229, Section 6.2.2 Current Velocities, Circulation, and Tidal Effects; last sentence in each of the first and second paragraphs. Explain how the peak current velocities can be the same during dry and wet weather conditions.

5. Pages 230 to 233, Section 6.3, Sections 6.3.1 Sediment Bed Characteristics, and Section 6.3.4 Deposition and Net Sedimentation. The existing bathymetric data does not appear to indicate that the creek is either "filling-in" or experiencing net sedimentation rates of 0.5-7.0 cm over the past 10-25 years. Describe the lines of evidence used to develop sedimentation rates, the range of sedimentation rates provided by each line of evidence per site area, and how the individual lines of evidence were combined to arrive at the 0.5 to 7 cm/year deposition rate.

6. Page 231, Section 6.3.2 Sediment Source and Inputs, third paragraph, third sentence. "Point source sediment loads occur during episodic discharge events that typically last 2 to 6 hours, as evidenced by higher Round 1 TSS concentrations during wet weather sampling, as compared to Round 2 concentrations (see Section 4.7.2.3)." While Round 1 wet weather TSS concentrations tend to be lower than Round 2 wet weather TSS concentrations, it should be

noted and explained in the text that in the majority of creek reaches during both the Round 1 and Round 2, wet weather TSS concentrations are generally lower than dry weather TSS concentrations (Figure 4-87). This condition occurs in both the shallow and deep wet weather surface water samples and requires further discussion and explanation.

7. Page 232, Section 6.3.2 Sediment Sources and Inputs, first paragraph, first full sentence. It is stated that "Slumping and cracking when the intertidal sediment is exposed and dewatered during low tide may affect the stability of sediment in the accreted areas near certain CSO outfalls as well." Has slumping of intertidal sediment been observed? If so, the observations should be described in the text.

8. Page 233, Section 6.3.4 Erosion, first paragraph. This paragraph describes erosion of the sediment bed through prop wash but fails to address the volume or mass of sediment that becomes resuspended and the resulting total load of COPCs that re-enter the water column. The section should be revised based on USEPA's comments on the prop wash model.

9. Page 233, last sentence. Low current velocities alone are not sufficient evidence of a net depositional system. Further explanation is needed. Describe the lines of evidence used to develop sedimentation rates, the data quality of each sedimentation rate line of evidence, the range of sedimentation rates provided by each line of evidence per site area, and how the individual lines of evidence were combined to arrive at the 0.5 to 7 cm/year deposition rate

10. Page 235, Section 6.4.1 Chemical Partitioning Characteristics, second bullet. This statement emphasizes the need to have a full sediment transport model in the East River to be able to much more accurately calculate the exchange of particulate chemicals between these two tidal water bodies. Also, as stated in Section 6.4.2.2, "tidal exchange with the East River is the dominant mechanism controlling surface water chemical concentrations in the main stem of Newtown Creek and the lower tributaries under dry weather conditions".

11. Section 6.4 Chemical Fate and Transport.

    a. Pages 244 to 247. The narrative in this section needs to be clearer regarding whether the data and trends discussed are for the dissolved COPC fraction of surface water only or for whole water.

    b. Page 245, first paragraph. As stated in the last sentence, the "influx of East River water strongly affects concentrations within most of the main stem and the lower tributaries". Once again, this influx, which is effected by physical transport, and chemical and biological processes in the East River as well as by the efflux of chemicals from Newtown Creek, cannot be accurately modeled using the simplified sediment transport modeling approach (i.e., hard bottom, no sediment settling) being used in the East River.

    c. Page 245, second paragraph. Explain how copper water column concentrations being relatively constant throughout the Study Area indicate that fluxes from surface sediment are less important than exchange with the East River.

d. Page 246, last paragraph. This paragraph states that a potential dilution effect is exhibited by lower concentrations of TPCBs in English Kills while TPAH concentrations do not indicate that dilution is occurring. This must be resolved or explained in the text.

e. Page 247, second complete paragraph. This paragraph concludes that the East River is not impacted to the same degree as Newtown Creek during wet weather. It should also be considered that effects of the wet weather discharges occur in the East River after sampling was completed or that other wet weather discharges are diluted by the large volume of water in the East River.

12. Page 354, Section 6.4.4.2, first paragraph. The fourth and sixth sentences in this paragraph once again emphasize that the importance of accurately simulating the exchange of sediment between Newtown Creek and the East River. If the exchange of sediment is not being accurately simulated, then the exchange of adsorbed chemicals cannot be either.

13. Page 255, Section 6.4.4.3 Losses of Chemicals from the Surface Sediment. This section describes a process by which sediments are buried by cleaner solids settling out of the water column. Any locations where the rate of settling solids is not sufficiently high to overtake sorbing of contaminants from impacted groundwater or ebullition facilitated migration of COPCs should be identified.

14. Page 252, Section 6.4.3.2 Particulate Phase Sediment/Water Exchange, continuing paragraph. This paragraph states that COPC concentrations in Turning Basin sediment traps are significantly lower than surrounding surface sediment. The reason given is that cleaner solids from the East River and point sources settle in this reach. There are other potential causes for this condition including surface sediment contamination by the amount of ebullition facilitated NAPL migration that appears to occur in this area. This should be discussed in the text.

15. Page 263, section 6.4.5.3 Sorption and Desorption in the Subsurface Sediment, first continuing paragraph. This paragraph describes distribution of TPAHs between groundwater, porewater, and surface water and concludes that lower concentrations of TPAHs in the porewater are related to the sorption of the TPAHs to carbon-containing sediment. Data also show that salinity is often lower in the porewater than surface water which likely indicates a mixing zone that is present in the porewater. This is quite likely the case for the diluted TPAHs as well and reflects the tidal influence on seepage. For example, at EK093, seepage is 0.3 cm/day, salinity in surface water and porewater are similar and TPAH is lower in porewater than in groundwater. Discuss the potential for dilution of TPAHs in shallow porewater by tidal pumping.

16. Page 269, Section 6.4.7.2 Mobil NAPL Migration in Native Material/Subsurface Sediment, continuing paragraph. This paragraph states that NAPL is largely immobile. It is understood that under static conditions, the intent of the narrative is to indicate that the NAPL is not flowing or able to be recovered. However, it should also be stated that during anchoring, dredging, bulkhead repair, etc. NAPL could be mobilized and can migrate to the surface water. Also, it should be stated in the text that immobile NAPL is available for transport via groundwater advection and by ebullition.

17. Page 271, Section 6.4.7.5 NAPL Movement on Surface Water, third paragraph. Shoreline seepage of NAPL has been observed. Include this potential source in the list of potential sources of NAPL to surface water.

18. Page 272, footnote. It is unclear how the chemical fate and transport model will be able to accurately quantify the chemical fluxes discussed in this footnote due to the problems previously discussed with the simplified sediment transport model in the East River.

19. Page 273, Section 6.5.1, Methods and Results for Inventory and Load Estimates, first paragraph. The text should be revised to emphasize that although fate and transport focused calculations are being presented here that include consideration of fate and transport within the Study Area, the Chemical Fate and Transport modeling is being conducted as part of the Feasibility Study. Such modeling needs to be conducted with an approach that considers the results presented in the RI Report as preliminary and subject to change, pending FS stage field work results as well as updates that may be needed based on other FS activities.

20. Page 275, Section 6.5.1.3 Sediment/Water Interface Chemical Mass Exchange, first bullet. Include a more detailed description of the selection and use of the porewater exchange coefficient.

21. Pages 273 to 277, Section 6.5.2 Comparison of Mass Load and Inventory Estimates. Because of the large volume of COCs inventoried in the subsurface sediments, calculations of COC diffusion flux should be conducted and results should be described to eliminate concern related to this mechanism.

22. Page 280, Section 6.5.2.2 TPCB, last bullet. Add the CM2+ as a reach where sediment TPCB concentrations and per acre mass of PCBs are elevated. In fact, nearly all stretches of the creek have elevated concentrations of TPCBs relative to reference areas.

23. Page 281, first sentence. "Bioaccumulation is the process by which chemicals accumulate in biological tissues, increasing with each trophic level, potentially reaching higher concentrations…". Bioaccumulation is the process by which chemicals accumulate in tissues, but the process of increasing with each trophic level is biomagnification. The statement should be clarified.

24. Page 281, first paragraph, second sentence. "This section focuses on TPCB because the BHHRA and BERA identified PCBs as the primary chemical of concern via food ingestion, and because PCBs are bioaccumulative." The BHHRA shows that PCBs, dioxins, and pesticides (dieldrin and heptachlor epoxide) are the risk drivers, and all of them are bioaccumulative. The BERA shows that PAHs, PCBs, and copper are risk drivers, and all of them are bioaccumulative. The discussion in this section should be revised to include all contaminants found to drive human health and ecological risk in the Final BHHRA and Final BERA.

25. Page 281, second paragraph, third sentence. The text "(e.g., point sources, East River, and others)" should be revised to include "industrial activities, chemical spills, NAPL". As stated,

it appears that the potential sources for bioaccumulative chemicals exclude conditions and operations related to the site.

26. Page 281, third paragraph, fourth sentence. Delete "at EPA's request".

27. Page 282, Section 6.6.2.1 Resident Oganisms, The possible home range of 380 meters cited for mummichog is only seen in systems with extensive contiguous tidal wetlands. In areas with restricted habitats, such as those in the study area, home ranges of mummichog are much closer to the lower values provided (30-40 meters). Revise the text accordingly.

28. Page 282: The discussion in this section should include all contaminants found to drive human health (PCBs, dioxins, dieldrin, and heptachlor epoxide) and ecological risk (PCBs and PAHs).

29. Page 282, first paragraph, first sentence. Delete "of PCBs".

30. Page 282, third paragraph, first sentence. Delete "except for white perch". There is no strong relationship between lipids and PCB for white perch (r2=0.52 does not represent a strong correlation here).

31. Page 283, footnote 98, first line. "biota-sediment accumulation factor" is included within the text twice; delete one occurrence.

32. Page 283, footnote 98, last sentence. Delete the last sentence: "This is particularly evident in the mobile species in Newtown Creek, whose home ranges are known to exceed the Study Area, as discussed in the next subsection."

33. Page 284, first incomplete paragraph. Whenever discussing the r2 values for statistical relationships, both in the text and on the associated figures, include the p value to show significance. The p value is included in the text, but not on the associated figures.

34. Page 285, first paragraph, third sentence. Delete: "…these species are exposed to contaminants outside the Study Area…" Unless NCG has data to show that the fish tissue collected for this RI was contaminated by PCBs from other locations, the inclusion of such a statement biases the discussion.

35. Page 285, second paragraph, second sentence. "…additional sources of exposure must be considered." Given the concentrations of contaminants in Newtown Creek sediment, it is likely that the vast majority of a striped bass life cycle would be spent in areas with less contamination. To state that additional sources of PCBs added to the fish tissue burden is biased. It is possible that Newtown Creek is the most contaminated area the collected fish had ever visited. Any discussion of adding tissue body burden from outside the Study Area must also emphasize that migratory fish may dilute their body burden by foraging in non-contaminated areas.

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Section 7 Risk Assessment Summary

General Comments

1. The BHHRA has not been finalized. Revisions to this section may be necessary upon completion of revisions to the BHHRA, and acceptance by USEPA.

2. The BERA has not been finalized. Revisions to this section may be necessary upon completion of revisions to the BERA, and acceptance by USEPA.

Specific Comments

1. Page 287, Section 7 Risk Assessment Summary, paragraph 1. Change "exposure to hazardous substances" to "exposure to CERCLA hazardous substances" in the first sentence.

2. Page 287, Section 7.1 Human Health Risk, paragraph 1. Change "exposures to hazardous substance releases in the Study Area" to "exposures to CERCLA hazardous substances present in the Study Area" in the first sentence.

3. Page 287, Section 7.1. Human Health Risk, paragraph 1. Change "data used in the BHHRA are comprehensive, consisting of…" to "data used in the BHHRA consist of…". The set of sediment data used for most receptors in the BHHRA was more focused than comprehensive (i.e., only 5 to 15 of the 399 samples were used to evaluate all scenarios except flooding).

4. Page 287, Section 7.1 Human Health Risk, paragraph 2. The summary should give an indication of the magnitude of estimated risks and not just state that risks were above certain thresholds. Change the first sentence of this paragraph to the following (italics used here to indicate the added text): "The BHHRA concludes that the only recreational receptor categories and exposure pathways with estimated cancer risks above the USEPA acceptable cancer risk range (i.e., up to 8 x 10-4) and noncancer hazard index (HI) greater than the threshold of 1 (i.e., up to 40) result from the consumption of fish and crab tissue by recreational anglers and crabbers."

5. Page 288, Section 7.1 Human Health Risk, first complete paragraph on page 288. Change the last sentence from "For the general construction worker, no individual COPCs exceed the HI threshold of 1" to "For the general construction worker, the HIs were less than 1 for all target organs except the CNS. The HI for potential CNS effects was just over 1 primarily due to PCBs in sediment."

6. Page 290, Section 7.1.2 Exposure Assessment, paragraph 2. In the third sentence, change "recreational activities in Newtown Creek" to "recreational activities along much of the shoreline of Newtown Creek."

7. Page 290, Section 7.1.2 Exposure Assessment, paragraph 2. Remove the last two sentences of the paragraph starting with "Furthermore, the NYSDOH has issued sportfish health advisories…". As noted in the comments on the December 2015 BHHRA report, sportfish

advisories are an exposure control, intended to limit public exposure to chemical contamination in fish or shellfish that may occur because of contaminated areas like the site itself, while that contamination persists. However, a BHHRA is supposed to estimate the current and future baseline risks posed by a site in the absence of exposure controls. Consistent with revisions to the BHHRA, discussion of potential impacts of sportfish advisories on risks must be limited to the uncertainty analysis (summarized in Section 7.1.6 of the RI). In addition, any such discussion must note that the reasonable maximum exposure (RME) for angler/crabber is not assumed to be aware of, or adhere to, sportfish advisories and that such advisories are not within the purview of USEPA (i.e., advisories may influence current fishing/crabbing behavior for a portion of the population, but may not exist in the future to influence future fishing/crabbing behavior). Note that if the sportfish advisory text is moved to Section 7.1.6, it must be revised to accurately summarize those advisories: NYSDOH has not set an advisory for dioxins in fish in these waters.

8. Pages 291 to 292, Section 7.1.2 Exposure Assessment. The phrase "as directed by USEPA" is used excessively (e.g., seven times in these two pages). Given that USEPA has directed the NCG to complete the entire RI/FS, all the information within the document could be considered to be EPA-directed. In addition, if intended to convey NCG disagreement with a specific approach, that is already documented in the record and the use of the phrase in this summary is too vague to indicate the point of objection and is potentially misleading (e.g., a complete exposure pathway could be evaluated either qualitatively or quantitatively in the BHHRA; saying that a qualitative evaluation was "directed" implies that the NCG would have preferred a quantitative evaluation, which is not the case). Unless it is be documented that USEPA provided specific direction on a specific item or topic, delete "as directed by USEPA" from the document.

9. Page 292, Section 7.1.2 Exposure Assessment, flooding scenario bullet. Inhalation of ambient air during flooding is not assumed to have "low exposure potential." Revise the second sentence in this bullet to: "Inhalation of ambient air during flooding would also occur and was evaluated qualitatively due to the uncertainty in estimating air concentrations related to flooding events."

10. Page 292, Section 7.1.2 Exposure Assessment, paragraph below bullets. Remove the third (final) sentence of this paragraph. The purpose of a CSM figure in the BHHRA is not "to memorialize the pathways that were agreed upon by the NCG and USEPA" but to summarize potentially complete exposure pathways associated with the site and how they are evaluated in the BHHRA. Change the third sentence to: "The CSM is used to identify potentially complete and incomplete exposure pathways and, for potentially complete exposure pathways, whether the pathways are to be evaluated qualitatively or quantitatively in the BHHRA."

11. Page 295, Section 7.1.3 Toxicity Assessment, first full paragraph, third sentence. Since both chronic and sub-chronic exposures are evaluated in the BHHRA, change the end of the sentence from "during a lifetime" to "during a lifetime for chronic RfDs or during a portion of a lifetime (i.e., less than one year) for sub-chronic RfDs."

12. Page 296, Section 7.1.4 Risk Characterization, second paragraph. The text regarding HQs and HIs has some repetition and should be revised for clarity and accuracy. Revise the second half of the paragraph, starting with "Consistent with USEPA guidance…" as follows: "HQs for individual COPCs and exposure routes are then summed to calculate an HI. However, summing the HQs for COPCs that differ in target organ and/or mechanism of action could overestimate the potential for adverse health effects. Therefore, consistent with USEPA guidance (USEPA 1989), if an HI for an exposure pathway is greater than unity, target organ-specific HIs are calculated to indicate the potential for noncancer hazards from simultaneous exposure to several COPCs. The conclusions of this analysis are included in the risk characterization summaries that are provided later in this section."

13. Page 296, Section 7.1.4 Risk Characterization, third paragraph. Revise the first sentence to: "The conclusion of the BHHRA risk characterization is that the only unacceptable human health cancer risks or noncancer hazards were associated with recreational fishing and crabbing consumption and general construction work."

14. Pages 297 through 300, Section 7.1.4 Risk Characterization. Text, and not just tables, in the risk characterization section should give some indication of the magnitude of estimated risks/hazards that exceed thresholds. It is not adequate to just state that risks or hazards exceeded thresholds.

    a. Page 297, paragraph after bullets, second sentence. Add to the end of the sentence "(i.e., cancer risks up to 8 x 10-4 and noncancer HIs up to 40)."

    b. Page 297, paragraph after bullets, third sentence. Insert "(i.e., HI = 2)" after "noncancer HI threshold of 1"

    c. Page 299, third paragraph, third sentence. Revise the sentence to: "For the recreational angler/crabber, the estimated CTE cancer risks for all age classes and tissue types are within USEPA's acceptable risk range of 1 x 10-6 to 1 x 10-4, and the estimated CTE noncancer HIs are above the threshold of 1 (i.e., HIs ranging from 2 to 5)."

15. Pages 298 and 299, Section 7.1.4 Risk Characterization. Remove sentences comparing cancer risks for individual COPCs to the USEPA acceptable risk range; cancer risks are assumed to be additive and the total risk should be compared to the USEPA risk range. When the total risk exceeds the risk range, identify the primary COPCs contributing to that risk, regardless of whether the COPC-specific risks individually exceed the risk range.

16. Pages 298 and 299, Section 7.1.4 Risk Characterization. Similar to the previous comment, remove sentences comparing HQs for individual COPCs to the threshold of 1. In cases where target organ-specific hazard indices (HIs) exceed the threshold of 1, identify the primary COPCs contributing to the HIs, regardless of whether the COPC-specific HQs individually exceed the threshold.

17. Page 302, Section 7.1.6 Uncertainty Analysis, third paragraph, second sentence. The fish and crab consumption rates used in the BHHRA do reflect some of the conditions relevant to the Study Area. In the second sentence of this paragraph, delete the phrase "do not consider the

site-specific Study Area conditions" and replace it with "do not account for all the site-specific Study Area conditions."

18. Page 302, Section 7.1.6 Uncertainty Analysis, third paragraph. Insert after the third sentence: "NYSDOH sportfish advisories are an exposure control, intended to limit public exposure to chemical contamination in fish or shellfish that may occur because of contaminated areas like the site itself, while that contamination persists. A BHHRA is supposed to estimate the current and future baseline risks posed by a site in the absence of exposure controls, so the RME angler/crabber was not assumed to be aware of/adhere to sportfish advisories. However, the portion of the angling population that does adhere to sportfish advisories will have a much lower consumption rate than was assumed in the BHHRA."

19. Pages 302 to 303, Section 7.1.6 Uncertainty Analysis. The scenario labeled "FI=0.5" does not match USEPA Region 2's use of Fraction Ingested, which apportions consumption from areas within a site. Consistent with revisions to be made to the BHHRA, the alternative scenario termed "FI=0.5" should be relabeled to "broader recreational angler" to reflect that the ingestion rate is being halved to account for fish that may be caught in locations outside the site.

20. Page 303, Section 7.1.6 Uncertainty Analysis, first and second paragraphs. Consistent with revisions to be made to the BHHRA, the alternative scenarios assuming compliance with sportfish advisories or only 50% of consumed fish or crab coming from the Study Area do not reflect reasonable maximum exposures. Remove any reference to "RME" when characterizing these scenarios.

21. Page 303, Section 7.1.6 Uncertainty Analysis, third paragraph, first sentence. Change "risk management" to "risk assessment".

22. Pages 303 to 304, Section 7.1.6 Uncertainty Analysis, first paragraph. Remove the sentence beginning "An underestimation of all human health risks associated with exposure to non-CERCLA…" Non-CERCLA substances are not a part of a CERCLA risk evaluation, which was already noted in the previous sentence.

23. Pages 304 to 305, Section 7.1.7 BHHRA Conclusions 7.1.7.1 Study Area. The summary should give an indication of the magnitude of estimated risks and not just state that risks were above certain thresholds.

    a. First bullet, regarding anglers/crabbers. Add "(i.e., up to 8 x 10-4)"to the end of the first sentence. Add "(i.e., up to HI=40)" to the end of the second sentence.

    b. Second bullet, regarding general construction worker: Add "(i.e., HI=2)" to the end of the first sentence.

    c. Fourth bullet, regarding CTE scenario: Add "(i.e., up to HI=5)" to the end of the first sentence.

24. Page 305, Section 7.1.7 BHHRA Conclusions 7.1.7.1 Study Area, third bullet. Key COPC contributors to elevated total risk and noncancer hazard estimates should be identified even if the risk or HQ for the individual COPC alone does not exceed the threshold. The bullet does identify the key COPCs, but wording of the bullet must be revised to reflect this fact. Change this bullet to "For the RME recreational consumption of fish and crab exposure scenarios for the Study Area, the primary contributors to both cancer risks and noncancer hazards are PCBs and dioxins/furans (i.e., total nondioxin-like PCB congeners, total PCB congener TEQ, and total dioxin/furan TEQ). For the RME general construction worker, the primary contributor to noncancer hazard is total nondioxin-like PCBs congeners."

25. Page 305, Section 7.1.7 BHHRA Conclusions 7.1.7.2 Phase 2 Reference Areas, first bullet. The summary should give an indication of the magnitude of estimated risks and not just state that risks were at the upper end of or above certain thresholds. Revise this bullet to: "RME cancer risks associated with the Phase 2 reference area fish and crab consumption are at the upper end of USEPA's acceptable risk range for striped bass (i.e., up to 1 x 10-4), and exceed USEPA's acceptable risk range for white perch and blue crab (i.e., up to 2 x 10-4). RME noncancer HIs for the reference areas exceed the threshold of 1 (i.e., up to HI=10)."

26. Page 305, Section 7.1.7 BHHRA Conclusions 7.1.7.2 Phase 2 Reference Areas, second bullet. Change "and COPCs in the species" to "and a portion of the COPCs in the species"

27. Page 306, Section 7.1.7 BHHRA Conclusions 7.1.7.2 Phase 2 Reference Areas, first bullet on page. Consistent with previous comments regarding comparison of individual COPC risks or hazards to thresholds, revise this bullet as follows: "For the RME recreational consumption of fish and crab from the Phase 2 reference areas, the primary contributors to both cancer risks and noncancer hazards are PCBs and dioxins/furans (i.e., total non-dioxin-like PCB congeners, total PCB congener TEQ, and total dioxin/furan TEQ)."

28. Page 307, Section 7.2.1 Receptors and Exposure Pathways Evaluated, first complete paragraph. The text states that the most common crab is the blue crab, followed by the horseshoe crab. There were numerous small intertidal crabs (e.g., rock crabs) that were not included in the biota surveys. The surveys also did not enumerate the invertebrates (e.g., starfish, snails, bivalves) inhabiting the bulkheads and rocks. This section needs a statement that the biota surveys were not exhaustive, and that a significant number of fish and invertebrate species were potentially not accounted for due to the design and performance of the biota surveys.

29. Page 307, Section 7.2.1 Receptors and Exposure Pathways Evaluated, third paragraph, third sentence. "The lack of aquatic macrophyte community is likely due to the physical attributes of the Study Area and the characteristics of the substrate." This statement ignores the elevated sediment concentrations of chemical contamination due to industrial activity, spills, releases, and NAPL. It is likely that macrophytes would be present in the absence of contamination. The statement is incomplete, and should either be deleted or the passage should be revised to include impacts on the aquatic macrophyte community due to physical attributes of the Study Area and due to years of chemical discharges and releases of contaminants.

30. Page 311, Section 7.2.4 Baseline Risk Analysis, second sentence. "…to further focus the BERA on those contaminants that are likely the most important contributors to ecological risk." The BERA cannot ignore contaminants simply because they are not among the most important contributors to risk. While addressing the primary risk drivers may cover most of the site, there may also be portions of the site in which secondary risk drivers pose risk. The text should be modified.

31. Page 311, Section 7.2.4.1 Aquatic Life, fourth sentence: "The use of Study Area-wide 95% UCLs is justified given that, in general, there are no areas with elevated concentrations that warrant examination on a smaller spatial scale." This sentence is misleading. The areas in the Turning Basin, East Branch, English Kills, and Dutch Kills have significantly higher concentrations of PAHs and PCBs in surface sediment. In fact, 19 of the 20 highest surface sediment concentrations of PAHs (ranging from 128 mg/kg to 784 mg/kg) are found in the downstream portion (greater than a half mile from the CSO) of English Kills, the downstream portion of East Branch, and in the Turning Basin. The use of Study Area-wide 95% UCLs serves to dilute the COPEC concentrations utilized in exposure modeling, by including the lower COPEC concentrations from the main stem of Newtown Creek, and the reach between the East River and Dutch Kills. The use of Study Area-wide 95% UCLs is not justified, and additional spatial breakdown (e.g., Turning Basin, East Branch, English Kills, Dutch Kills, Whale Creek, Newtown Creek from the East River to Dutch Kills, and Newtown Creek from Dutch Kills to the Turning Basin) would be more representative of the exposure to site contaminants.

32. Page 315, Section 7.2.4.2 Benthic Macroinvertebrates, first and second complete paragraphs. Delete these paragraphs. . The paragraphs effectively state that mineral oil is responsible for the stress to the benthic community, yet offers no proof. The discussion of confounding factors, mineral oil, and aliphatic hydrocarbons was initially part of the formal dispute submitted by NCG on December 22, 2016. However, this issue was resolved through technical discussion. The resolution included that the BERA is to be revised to include a more robust discussion to characterize the confounding factors. Until such revised text is included in the final BERA and accepted by the USEPA, the discussion should not be included in the RI.

33. Page 316, Section 7.2.4.2 Benthic Macroinvertebrates, first paragraph. The discussion lists sediment sample locations "adjacent" to the largest CSOs, and states that the highest C19-C36 concentrations are responsible for observed toxicity. In English Kills, two of the four listed locations, EK059 and EK065, are a half mile or more from the CSO, and listed location EK059 had 154.6 mg/kg PAHs, yielding a PAH TU=149. In East Branch, one of the two listed locations, EB006, is not adjacent to the CSO. In Maspeth Creek, the three locations are all closer to sediment locations with some of the highest measured PAH concentrations than they are to the CSOs. In all of the tributaries, the few locations mentioned in this paragraph are surrounded by sample locations with PAH concentrations high enough to cause the observed toxicity. While Figure 7-5 does indicate that C19-C36 concentrations correspond to observed toxicity, it does not support the assertion that toxicity is CSO-related. The paragraph should be revised to remove the biased statements emphasizing that CSOs are responsible for benthic impacts. Also se comment no. 32.

34. Page 316, Section 7.2.4.2 Benthic Macroinvertebrates, second paragraph. The concentration-response models in the BERA were not acceptable. The BERA attributes "error rates" to samples that do not correspond to the model predictions based on PAH toxic units and SEM metals toxic units which essentially ignored all other contaminants present at elevated concentrations in the sediment. This paragraph should be deleted.

35. Page 317-318, Section 7.2.4.4 Wildlife. Cormorant site use was modified to reflect foraging outside the Study Area and seasonal migrations. Cormorants are present in the Study Area year-round, and the exposure modification factor should be 1. The April 11, 2017 Newtown Creek Final Dispute Resolution Memo states that a range of exposure modifying factors should be used for all receptors. This section should be revised.

36. Page 318, Section 7.2.4.5.1 Fish and Crab Surveys, second paragraph, first sentence. "Fish and crab were collected from six zones…". In Section 7.2.4.1 Aquatic Life, the 4th sentence states "The use of Study Area-wide 95% UCLs is justified given that, in general, there are no areas with elevated concentrations that warrant examination on a smaller spatial scale." Add an explanation why the biota populations were treated on a smaller spatial scale than the COPECs.

37. Page 320, Section 7.2.4.5.2 Wildlife Surveys, first full paragraph, eighth sentence. For the purposes of the BERA, the exposure modification factor for the cormorant should be 1. Therefore, delete reference to the cormorant spending time in the East River. See comment no. 5.

38. Page 312, Section 7.2.4.5.2 Wildlife Surveys, fifth bullet. As discussed in Section 7.2.1, stating that the lack of aquatic macrophyte community is due to the physical attributes of the Study Area ignores the elevated sediment concentrations of chemical contamination due to industrial activity, spills, releases, and NAPL. It is likely that macrophytes would be present in the absence of contamination. The statement is incomplete, and should either be deleted or the passage should be revised to include impacts on the aquatic macrophyte community due to physical attributes of the Study Area and due to years of chemical discharges and releases of contaminants.

39. Page 322, Section 7.2.5 Uncertainty Analysis, General Uncertainty Comment. At multiple places in this section it says that something could result in an overestimation or underestimation of risk. The third option is that the risk estimation is appropriate. Modify these statements to say the effects of uncertainty are unknown.

40. Page 322, Section 7.2.5 Uncertainty Analysis, third paragraph, third sentence. The statement that use of 95% UCL tissue concentrations will overestimate risk should be revised to state that the risks may be overestimated or underestimated. Because the 95% UCL was based on a small number of tissue samples, the uncertainty is unknown. It is just as likely to underestimate risk as overestimate risk.

41. Page 322, Section 7.2.5 Uncertainty Analysis, third paragraph. Delete the last two sentences. The sentence immediately preceding them says that the uncertainty is unknown, but then the last two sentences say risk is overestimated.

42. Page 323, Section 7.2.5 Uncertainty Analysis, first paragraph, fourth sentence. Delete this sentence. The use of larger menhaden did not necessarily overestimate risk. Cormorants can and do eat larger fish, while other piscivorous bird species (which are represented by the kingfisher and cormorant) will eat larger fish and will eat large dead fish.

43. Page 323, Section 7.2.5 Uncertainty Analysis, second paragraph. Delete this paragraph. The second sentence says some of the SLs were inappropriate because they were based on protecting the food chain, or were freshwater based, or more recent toxicity data are available. The screening levels in the hierarchy are acceptable screening levels, based on sound science. The third sentence in this paragraph says the SLs could result in over- or underestimate of risk. Again, the third option is that the risk estimation is appropriate. The fourth sentence says that SLs for some COPECs are conservative and will overestimate risk, although the statement is not supported.

44. Page 323, Section 7.2.5 Uncertainty Analysis, third paragraph. This paragraph contradicts the preceding paragraph. The second paragraph faults SLs for not being generated for the species in question, or for fresh versus salt water. The third paragraph says that it is appropriate to use SLs derived from a suitable combination of studies and species, and gives a justification that could just as easily be used in paragraph 2.

45. Page 323, Section 7.2.5 Uncertainty Analysis, fourth paragraph, first sentence, on to page 324. Delete this sentence. The 10-day sediment test is a standard toxicity test that has been used successfully for many years. Additionally, the 10-day sediment test passed all acceptability criteria; the lab controls and reference area samples were also static exposures with no food, and yet they were acceptable. The toxicity observed in the Study Area samples was due to site-related COPECs. . The April 11, 2017 Final Dispute Resolution Memo states that the 10-day sediment toxicity study should be included in the BERA and given the same weight as the 20-day study.

46. Page 324, Section 7.2.5 Uncertainty Analysis, first incomplete paragraph, last sentence. The comparison only includes porewater COPECs, while comparison to bulk sediment COPECs may explain some of the observed results which are called confounded and uncertain. Revise the text to include bulk sediment comparisons.

47. Page 324, Section 7.2.5 Uncertainty Analysis, first complete paragraph, seventh sentence. Delete this sentence. Using LOAELs to derive TRVs does not overestimate risks. The use of NOAELs to derive TRVs would open an argument regarding overestimation of risks, but LOAELs could just as easily underestimate risk as overestimate risk.

48. Page 324, Section 7.2.5 Uncertainty Analysis, first complete paragraph, last sentence. The sentence needs clarification; it is unclear how the use of multiple lines of evidence to evaluate COPECs could result in the conclusion that they are less likely to contribute to risk? Multiple lines of evidence are used to develop a weight of evidence approach that can either strengthen the confidence that a COPEC poses risk or strengthen the confidence that it does not pose risk.

49. Page 324, Section 7.2.5 Uncertainty Analysis, second complete paragraph. This section discusses the 3Ps (pharmaceuticals, personal care products, and pathogens). These

constituents were excluded from evaluation in the Human Health and Ecological Risk assessments and should also be excluded from evaluation in the RI Report.

50. Pages 324-326, Section 7.2.6 BERA Conclusions, General Comment. The draft BERA has not yet been finalized. The conclusions of the BERA may be revised based on USEPA's comments. The BERA section of this RI will also require revision after the BERA is finalized.

51. Page 326, Section 7.2.6 BERA Conclusions, last paragraph. The Conclusions section closes with a discussion about non-CERCLA stressors. Physical habitat and salinity are the "dominant" stressors controlling birds, fish, and crabs. However, the discussion should include a statement that in the absence of sediment contamination, it is likely that the populations of birds, fish, and crabs would be both higher and more diverse.

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Section 8 Conceptual Site Model

Specific Comments

1. Page 327, Section 8.1, bulleted list of conceptual site model (CSM) elements, third bullet. The text should note that the fate and transport characteristics include both chemical-specific (e.g., solubility and adsorption) and site-specific fate and transport characteristics (e.g., hydrodynamics).

2. Page 327, Section 8.1, second paragraph. The CSM should distinguish between point source and non-point source discharges (presumably overland flow). Non-point sources are important from a regulatory perspective since they are not permitted. Non-point sources should be depicted on Figure 8-1.

3. Page 327, Section 8.1, third paragraph. The risk threshold should be 1 x 10-6 since this is the "point of departure" under Superfund and is used to establish preliminary remediation goals (PRGs) (Risk Assessment Guidance for Superfund: Volume I – Human Health Evaluation Manual, Part B, Development of Risk-Based Preliminary Remediation Goals, EPA/540/R-92/003. Publication 9285.7-01B. December 1991). In addition, this section should note that recreational anglers and crabbers are potentially exposed to COPCs through fish and shellfish consumption to distinguish between other routes of exposure such as direct contact with sediment while fishing or crabbing.

4. Page 328, Section 8.1, first partial paragraph. The CSM should describe any potential risks to piscivorous birds and mammals evaluated in the BERA.

5. Page 328, Section 8.1, first full paragraph. The text should describe the results of any evaluation that has been conducted to distinguish between risks associated with CSO and MS4 discharges and risks associated with industrial discharges and COPCs in sediment or this discussion should be deleted. The text should further state that the mixing of these discharges with hazardous substances within the sediment bed makes this contamination potentially actionable under CERCLA. Finally, the recontamination potential associated with CSO and MS4 discharges must be considered during the development of a remedial strategy for the site. As a result, the CSM should describe the impact of CSO and MS4 discharges on natural recovery processes within Newtown Creek.

6. Page 329, Section 8.2, first partial paragraph. USEPA acknowledges the designation of Newtown Creek as a significant maritime and industrial area (SMIA). However, the CSM should discuss the potential for changes in land use associated with a transition from industrial uses to high density housing and commercial uses in the vicinity of Newtown Creek. Overall, the CSM should describe both current and reasonably anticipated future land and waterway use.

7. Page 331, Section 8.3, second full paragraph. The report states that several lines of evidence demonstrate the net depositional nature of Newtown Creek. However, the CSM should also discuss the potential for maintenance dredging and other anthropogenic activities to re-

expose buried sediments. As noted in Section 3.2.4, navigation dredging took place within the lower reaches of Newtown Creek as recently as 2014.

8. Pages 334 and 335, Section 8.4.1.2 NAPL. The discussion of NAPL should describe in greater detail the widespread presence of NAPL in sediment at the Newtown Creek site and discuss the implications for ongoing releases of NAPL to the water body on natural recovery processes and the contribution of NAPL to risks to human health and the environment at the site.

9. Page 337, Section 8.4.3 Surface Water

    a. Entire page. The discussion of surface water in the various reaches should include a discussion of the suspended particle concentrations during wet weather and dry weather flow conditions. The transport of suspended sediment particles within Newtown Creek is likely an important contaminant transport mechanism. As a result, the implications of changes in suspended sediment particle concentrations in the various reaches and flow conditions on contaminant transport within Newtown Creek should be presented and evaluated in the RI Report.

    b. Second and third bullets. There are significant details important for understanding the processes by which surface water is impacted that are omitted. Since this section is explaining the Study Area CSM, the following processes, with short summaries, should be included to help the reader understand, fully, why surface water is contaminated:

        i. Tidal pumping effects on porewater to that cause contaminant transport from contaminated subsurface and surface sediment with each tide

        ii. Ebullition-facilitated migration of NAPL that causes NAPL to be mobilized to surface water

        iii. Upland seeps of NAPLs to surface water

        iv. Erosion and discharge of soils and fill material to surface water

10. Page 340, Section 8.5.1, Historical Sources. For the primary contaminats evaluated in the RI Report, USEPA comments on Section 3 regarding identification of historical sources and associated contaminats should be carried through to the CSM. Potential upland sources or activities that contributed to the presence of those contaminants in the Study Area should be identified (i.e. copper refining for copper; petroleum refining for PAH, etc.).

11. Page 340, Section 8.5.2 Current Sources, bulleted list. The list of current sources is limited to external sources such as point source discharges, groundwater discharges, and river bank erosion. However, contaminated sediments within the sediment bed of Newtown Creek represent internal sources of contamination to the system. These internal sources can be taken up by biota or released to the water column during high flow events, reworking of the sediment bed or through advective groundwater transport and, as a result, inhibit natural recovery within the Newtown Creek system. The CSM should identify internal sources as a current source of contamination and discuss the impact of internal sources on contaminant transport within Newtown Creek.

12. Page 341, Section 8.5.2.1. Section 5.1 discusses the lack of flow data used to develop the mass loading estimates presented in Figures 8-13, 8-14 and 8-15. Section 8.5.2.1 should include a discussion of the uncertainty in the loading estimates and the impact of that uncertainty on the CSM. In addition, Figures 8-13, 8-14 and 8-15 should include loading estimate ranges that reflect the uncertainty of the loading estimate rather than single values. To improve clarity separate Figures 8-13, 8-14 and 8-15 into separate figures depicting loading terms (e.g., point source or atmospheric deposition loads) and figures depicting contaminant mass in the various media (e.g., surface water and surface sediment). Also, propwash is mentioned in the figures, but is not quantified.

13. Page 342, Section 8.5.2.2, second paragraph. The report states that the East River "contains nearly the full suite of urban chemical contamination associated with the NY/NJ Harbor urban estuary." This statement requires clarification and supporting documentation. What is the urban contamination that is being referred to, what is the concentration of this contamination in suspended sediments and what are the implications of this contamination on remedial strategies for the site? Further discussion of East River contaminant loading to the Newtown Creek site and the implications of such should be included in this section.

14. Page 342, Section 8.5.2.3, last paragraph. The CSM should distinguish between contaminated groundwater discharges and the transport of subsurface and surface sediment contamination to surface sediment and surface water via advection as depicted in Figures 8-13, 8-14 and 8-15. This is important from the standpoint of developing remedial strategies since hydraulic containment and control systems may be used to limit the discharge of contaminated groundwater discharges to the Newtown Creek site while sediment based remedies will be required to address advective contaminant transport.

15. Page 344, Section 8.5.2.3, first bullet item. The Report states that groundwater loads of TPAH, TPCB, and copper to the subsurface sediment of CM 0 – 2 are minor compared with the rest of the Study Area. While this is true for TPAH and TPCB, it is not true for copper. As noted in the last bullet, groundwater loads of copper are relatively uniform throughout the site (4.2, 6.6, and 5.7 kg/year for the three reaches of the Newtown Creek Site). The text correctly notes that the tributaries provide the majority of the TPCB groundwater load and that CM2+ provides the majority of the TPAH groundwater load.

16. Page 344, Section 8.5.2.4 Other Sources:

    a. First paragraph. The discussion of contaminant loads should distinguish between site-wide and reach-specific or localized loading. For example, while erosion of contaminated riverbanks may be a minor source of contamination to the Newtown Creek site, localized contamination that poses a risk to human health or the environment may result from these discharges.

    b. First bullet. Regarding the Frito Lay site, information should be updated to state that portions of the bulkhead are disintegrating and that water and soil can easily flow through the bulkhead.

    c. Second bullet. The information here should be revised to address seeps and to indicate the contribution of COPCs to the Study Area will be assessed in the FS Field Program.

d. Bullets. Add a bullet stating that additional evaluation of seeps and erosion may be significant and are being evaluated in the FS Field Program.

17. Page 345, Section 8.6.1, first paragraph. The report states that the two primary exposure pathways are exposure to bioavailable contaminants in surface sediment and surface sediment porewater, and exposure to contaminants in the water column. This eliminates a critical exposure pathway for the majority of contaminated sediment sites: the consumption of contaminated fish and shellfish by anglers and wildlife. The discussion of fate and transport processes should describe bioaccumulation and biomagnification within the food web.

18. Page 345, Section 8.6.1 Contaminant Fate and Transport Processes, (Sources to the water column) and page 346 (Fate and transport within the water column). The discussion presented in these two subsections should include estimates of surface water loading (dissolved and particulate) within the various reaches of Newtown Creek during a range of flow regimes to help understand changes in contaminant load within the system and where contamination may be entering the water column or depositing onto the sediment bed. This may be useful from the standpoint of identifying ongoing sources of contamination within the Newtown Creek Study Area.

19. Page 347, Section 8.6.1, paragraph following bulleted list. The report notes that the sediment bed is stable and that exposure of the food web to subsurface sediment is likely minimal and that the potential impacts of propwash will be further evaluated as part of future refinements to the sediment transport modeling. The CSM should also consider the potential for exposure to subsurface sediments through navigation or maintenance dredging or other maintenance activities (e.g., bulkhead replacement) that could result in exposure to subsurface sediments.

20. Page 348, Section 8.6.1, first full paragraph. The report notes that advective porewater flux is much lower than groundwater flux for each of the key site contaminants. However, the report does not provide sufficient details regarding the basis for the noted discrepancy between groundwater flux and porewater flux. The report seems to suggest that the difference between groundwater flux and advective porewater flux is due to the sorption of contaminants within the sediment bed due to the high organic content of subsurface sediments. To the extent this statement is true, contaminated groundwater discharges will continue to load subsurface sediments in the absence of hydraulic control and containment measures.

21. Section 8.6.1 Contaminant Fate and Transport Processes, Groundwater and porewater flow and contaminant transport.

    a. Page 347, first sentence of the section. Revise the following text for clarity: "Dissolved and free phase contaminants can be transported from subsurface sediment into the surface sediment by the processes of porewater flow and gas ebullition, both of which have been investigated as part of this RI."

    b. Page 347, last paragraph. The data do not appear to corroborate the information presented. It states that contaminants in groundwater are attenuated by the organic

content of the sediments. However Figure 4-142 shows attenuation in seven locations, no attenuation in another seven locations, and the data for three locations are inconclusive. Revise the text to include further discussion consistent with the conditions noted above.

Page 349, third paragraph, second sentence. Revise the text for completeness and clarity as follows: "The depth of gas ebullition is controlled in part by the presence of organic material, which in Newtown Creek is principally deposited sewage solids, petroleum hydrocarbons, and biological growth (e.g., phytoplankton). In areas where no free-phase hydrocarbons are present, gas ebullition is not always associated with contaminant transport. Some decay occurs at or near the surface of the sediment, before mixing can occur with the underlying bed."

22. Page 350, Section 8.6.1 Contaminant Fate and Transport Processes, Gas Ebullition:

    a. Continuing paragraph. Revised this paragraph to include language that more accurately describes ebullition in Newtown Creek. Ebullition occurs during changes in hydrostatic pressure, not necessarily in areas of shallow water. Therefore, ebullition is generally expected to occur up to two times over each 24 hour period in response to tides, although the intensity and duration of ebullition may vary with the magnitude of the change in hydrostatic pressure.

    b. First full paragraph. The report notes that sheen blossoms were noted in three discrete areas in the Turning Basin, and one discrete area in the upper English Kills. Based on these observations, the CSM should note that ebullition is a potential NAPL transport mechanism in certain areas of the Newtown Creek site. As is noted earlier in the report, USEPA has required that a quantitative gas ebullition study be conducted to address this migration pathway and support FS evaluations.

23. Page 350, Section 8.6.1, discussion of processes associated with surface sediment. The CSM fails to discuss bioaccumulation of contaminants. Bioaccumulation and tropic transfer is a key process associated with surface sediments. Differences in contaminant bioavailability can affect this process. The CSM should discuss bioaccumulation as a major contaminant fate and transport process at the Newtown Creek site.

24. Page 351, Section 8.6.1, first full paragraph. The report notes that contaminants can be transported from the surface sediment to the surface water in particulate form due to propwash resuspension or storm event erosion. The report should note that erosion of the sediment bed can also release dissolved contaminants to the water column on a relatively short term basis as the sediment particles are entrained into the water column.

25. Page 351, Section 8.6.1, first full paragraph. Section 6 of the RI report concludes based on an evaluation of the sediment that the particulate phase processes of deposition of chemicals associated with sources of external solids (i.e., from the East River and point sources), as well as localized resuspension and redeposition, are important sediment/water exchange processes for evaluating chemical fate and transport in the Study Area. However, the CSM does not discuss the sediment trap data in detail. Given the importance of this process, the

CSM should include additional analysis of the sediment trap data and the particulate phase transport within Newtown Creek.

26. Page 351, Section 8.6.1, last paragraph. Based on information presented in Figure 8-14, the total PCB load to the tributaries is approximately 1.3 kg/year. Loading estimates are provided for other contaminants and other reaches. The CSM discussion should include the implications for changes in surface sediment concentrations over time. For example, future control of CSO discharges may reduce contaminant loading to Newtown Creek and enhance natural recovery processes.

27. Page 352, Section 8.6.2, last full paragraph. When discussing natural recovery processes, the report states that concentrations decline due to reductions in contaminant loads to the system. USEPA notes that reductions in contaminant loads to the system are often a prerequisite for natural recovery and that monitored natural recovery (MNR) is unlikely to occur without controlling internal and external loads to the system. However, internal loads to the system associated with contaminated sediments within Newtown Creek are likely to inhibit natural recovery. The CSM should describe the link between internal loads, external loads, and natural recovery processes.

28. Page 352, Section 8.6.2, last full paragraph. The report states that decreases in surface sediment concentrations over time are a key metric used to evaluate natural recovery processes. The report should also note the potential for subsurface sediment concentrations to be exposed due to episodic natural erosion events or anthropogenic disturbance and the potential for these events to enhance or inhibit natural recovery of contaminated sediments at the Newtown Creek site.

29. Page 354, Section 8.6.2, Natural Recovery, first full paragraph. This paragraph references "potentially unremediated upland sites." This reference is vague needs to be clarified. It is not clear if the text is referring to Respondent sites, known hazardous waste disposal sites in a remedial program or, yet-to-be identified hazardous waste sites that may be contaminating Newtown Creek. If the phrase is referring to known hazardous waste sites, those sites should be identified or the reader should be referred to specific sections of the draft Data Applicability Report.

30. Page 354, Section 8.7, second bullet. The discussion of risk associated with consumption of fish and crab tissue from the Phase 2 reference areas seems out of place. The risk associated with exposures outside the Study Area should be discussed in the context of risk management rather than as a specific exposure scenario evaluated in the baseline risk assessment. In addition, the discussion of reference area risk and Study Area risk does not include any discussion of the relative magnitude of these risks and thus is misleading. For example, the risks to human health associated with fish consumption range between 2 x 10-4 and 5 x 10-4 which is 2.5 to 5 times higher than the reference area risks which range between 8 x 10-5 and 1 x 10-4.

31. Page 355, Section 8.7, last paragraph. The report discusses confounding factors that appear to influence toxicity to benthic invertebrates. USEPA further notes that improvements in water quality associated with future reductions in CSO and MS4 discharges will likely

reduce the influence of non-CERCLA hazardous substance stressors. The CSM should discuss the effect of future efforts to reduce CSO, MS4 and other discharges on reducing the risks associated with non-CERCLA hazardous substances.

32. Page 356, Section 8.7, last paragraph. The report notes that striped bass are migratory and may experience exposure to contaminants outside the Newtown Creek site. However, the risks to human health were greatest for the blue crab consumption pathway, which, as the report notes, are likely to exhibit greater local exposure than striped bass. Blue crab also show the largest difference between site risk and reference area risk than the other fish consumption pathways evaluated in the BHHRA and thus should be a focus of remedial decision making for the protection of human health at the site. Further evaluation of the relationship between TPCB and other COCs in sediment and crab tissue should be conducted.

33. Page 367, Section 9.3 Sources, first paragraph, third sentence. It should be recognized in this Section that groundwater discharging at low tide along shorelines has been observed by regulatory agencies to contain elevated solids.

34. Figure 8-3. This figure depicts key processes and sources within the primary reaches of the site. However, some statements presented in the figure do not appear to be well supported in the CSM. For example:

    a. CM 0-2: What basis is there to state that this reach reflects background conditions?

    b. CM 2+: What basis is there to state that natural recovery is occurring?

    c. Tributaries: What basis is there to state that natural recovery is occurring?

    The CSM should be revised to provide additional documentation regarding the above statements.

35. Figure 8-6. Figure 8-6 presents average deposition rates for different reaches of Newtown Creek based on multiple lines of evidence. A complimentary figure should be prepared that presents the changes in sediment bed elevation between the 1991 and 2012 bathymetric surveys in plan view to provide higher geographic resolution of the net sedimentation rates presented in Figure 8-6. The figure should also depict any maintenance or navigation dredging that may influence the depicted changes in bathymetry.

36. Figure 8-7. It is unclear how the relative portion of the East River solids was determined. The CSM should be revised to provide additional supporting information. In addition, the chart should show the overall deposition rate along with the proportion of East River solids.

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Section 9 Conclusions

General Comments

1. Section 9 includes both a summary of the RI and conclusions and should be renamed "Summary and Conclusions". In addition, the key conclusions of the RI should be provided in a separate Conclusions subsection.

2. The Conclusions Section should be revised to reflect and be consistent with the general and specific comments provided for Sections 1 through 8 of the RI Report.

Specific Comments

1. Section 9.1 Reach-Specific Characteristics:

    a. Page 360. This section should include the total area of the Study Area and the areas of each tributary. The range of widths for the various reaches/tributaries should also be stated.

    b. Page 361, continuing paragraph. The final sentence is unclear and must be clarified. "By way of example, the risks to the ecological communities at many locations in the tributaries are attributed primarily to significant ongoing discharges from CSOs and MS4s. Although those ongoing discharges are traditionally regulated by the CWA, they include CERCLA hazardous substances and other pollutants and contaminants that contribute to those risks and must be considered in the evaluation of remedial alternatives in those portions of the Study Area." The phrase "other pollutants and contaminants" should be removed and replaced with "confounding factors." Clarify exactly what must be considered in the evaluation of remedial alternatives; the confounding factors or the discharges.

    c. Page 362, first bullet, Sediment CM2+. This bullet should mention the 2016 Field Ebullition Survey.

    d. Page 363, Tributaries, last bullet. This bullet fails to recognize bulk sediment concentrations as a line of evidence for benthic toxicity. The text, "other contaminants and complex mixture of organic compounds" should be removed and other documented lines of evidence should be included, i.e. bulk sediment concentrations of COPCs, etc.

2. Page 365, Section 9.2 Background, fifth bullet. It should be noted in this bullet that tissue samples from Newtown Creek are consistently higher than reference areas. Also, the final sentence should be removed or revised as it does not present a complete and accurate picture of the accumulation of COPCs in tissue. First, assuming that the migratory species move around the harbor to the extent previously described and stated in the BERA, it has to be assumed that fish collected in reference areas potentially spent some time in Newtown Creek and could have accumulated some of their body burden there. Second, the discussion

of adding tissue body burden from outside the Study Area must also emphasize that migratory fish may dilute their body burden by foraging in non-contaminated areas.

3. Page 366, Section 9.3 Sources, first paragraph, end of the last sentence. Strike the following text "therefore, the locations of impacts observed today cannot necessarily be directly linked to proximate upland sources."

4. Page 368, Section 9.4 Fate and Transport, second paragraph, second sentence. The text states: "Larger particles settle closer to the release point, and finer particles and particles with higher organic matter content are generally transported farther." If particles with higher organic content are generally transported farther, then the statement appears to be inconsistent with the conclusions in the RI Report that sediments in the upper ends of tributaries have higher organic content and coarser sediments due to CSO discharges. Clarify the statement to explain this apparent inconsistency.

5. Page 369, Section 9.4 Fate and Transport, second full paragraph. The text states: "Residual NAPL, the condition where the NAPL saturation is sufficiently low that the NAPL consists of discontinuous blebs, is trapped by capillary forces and is, therefore, immobile." No data have been collected to date related to NAPL mobility; such data will be collected as part of the FS Field Program. Provide the basis for the assertion that NAPL is immobile. In addition, revise the text to note that residual NAPL, even if immobile, can serve as a long-term source of dissolved contaminants to groundwater.

6. Page 370, Section 9.5 Risk, second bullet. Section: Change "…primarily due to PCBs…" to "…primarily due to PCBs and dioxins/furans."

7. Page 370, Section 9.5 Risk, second Bullet. Replace the second sentence with: "… indicating that risks in the Study Area may continue to be above acceptable levels due to background levels of contamination."

8. Page 371, Section 9.5 Risk, last bullet. The text reads as follows: "…there are confounding factors that appear to be influencing toxicity to the benthic invertebrates in the tributaries near CSO and MS4 outfalls. Moreover, ongoing anthropogenic contributions to the Study Area can impact the ecological environment because of lower DO and salinity, whereas the constructed shoreline of the Study Area and lack of vegetation limits intertidal habitat that places restrictions on bird and mammal foraging." These statements are unbalanced in that they fail to address impacts on benthic habitat from internal sources in the sediment derived from discharges and releases of contaminants from historical operations along the creek. Revise the text to include impacts of legacy contaminants in the creek.

9. Page 371, Section 9.5 Risk, first bullet. The text states: "In these samples, the toxicity results appear to be confounded by a complex mixture of organic compounds that are not addressed in this RI but are linked to the proximity of CSOs, MS4s, and other stormwater discharges." Delete this sentence. If the RI data do not include data representing the "complex mixture of organic compounds" referred to in the sentence, then the RI report should not address such data.

10. Page 372, Section 9.6 Data Limitations, first full sentence. Include shoreline erosion and additional groundwater data collection that are planned as part of the FS Field Program.

11. Section 9.7, Summary, Page 372 – The first paragraph of this section states that surface sediment contamination influences ecological and human risks. Limiting the source of risk oversimplifies the CSM where migration of NAPL and dissolved contaminants in groundwater can impact concentrations of COPCs in surface water. The summary should be more comprehensive.

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